Booms and Lights

stryker®

Installation and Service Manual

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VISUM II
Monitor 1
Monitor 2

July 2011 1004-400-061 REV YB www.stryker.com

Stryker Booms and Lights

Installation and Service Manual

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Stryker Booms and Lights Installation and Service Manual

1004-400-061 REV YB

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1. Warnings and Cautions

Please read this manual and follow its instructions carefully. The words WARNING, CAUTION, and Note carry special meanings and should be carefully reviewed:

⚠ **Warning** **The personal safety of service personnel may be involved. Disregarding this information could result in injury to the patient.**

⚠ **Caution** **Special service procedures or precautions must be followed to avoid damaging the equipment.**

⚡ **Warning** **A warning with a lightening bolt warns of hazardous voltage. All service must be performed by authorized personnel.**

☞ **Note** Special information to make maintenance easier or important information more clear.

1.1 Safeguards and Precautions

Stryker trained personnel are the only personnel authorized to install the equipment described in this manual.

Incorrect operation or negligence of safety measures may cause damage to the equipment, bodily injury or death. Thoroughly read this manual before use.

- Do not add additional weight to the surgical lights.
- Do not place anything over the surgical lights.
- Do not look directly into the surgical light while powered on.

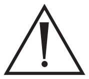
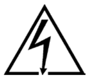
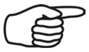
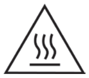
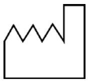
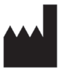
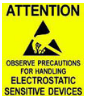
1.2 Warnings

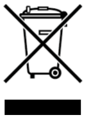
1. Be a qualified/trained installer for this equipment.
2. Test this equipment prior to release for use by hospital personnel.
3. Disconnect the unit from the electric outlet before inspecting or servicing system components. Note that more than one electrical supply may be used. Disconnect all power sources before inspecting.
4. The electrical installation of the operating room must comply with any applicable IEC, CEC, NEC requirements as well as the local codes and pre-installation manual.

⚠ **Caution** **Carefully unpack the unit and check to ensure that no damage occurred during shipment. If damage has occurred, please contact Stryker Communications.**

2. Product Symbol Definition

The following symbols may be found on the Stryker Booms and Lights equipment:

	An exclamation mark within a triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the product.
	A lightning bolt within a triangle indicates the presence of hazardous voltage. Refer all service to authorized personnel.
	Denotes usage tips and useful information.
CE	Denotes compliance to European Community Directive 93-42-EEC.
UL® LISTED EDS (29AZ)	Indicates the product is compliant "Medical Electrical Equipment with Respect to Electrical Shock, Fire, and Mechanical Hazard only in accordance with UL60601-1.
c UL® LISTED EDS (29AZ)	Indicates the product is compliant "Medical Electrical Equipment with Respect to Electrical Shock, Fire, and Mechanical Hazard only in accordance with CAN/CSA C22.2 No601.1.
CLASSIFIED c UL® US (13PZ)	Indicates the product is compliant "Medical Electrical Equipment with Respect to Electrical Shock, Fire, and Mechanical Hazard only in accordance with UL60601-1, CAN/CSA C22.2 No601.1.
	Indicates hot surfaces.
INTERTEK c ETL us LISTED	Denotes compliance to CSA Standard C22.2, 60601.1 - M90, AS 3200, IEC 60601, IEC 60601-2-41, UL 60601, EN 60601
	Denotes the date the equipment was manufactured.
	Denotes the manufacturer of the device.
 ATTENTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES	A yellow box with a hand within a triangle is intended to warn the user of the presence of an electrostatic sensitive device. Follow ESD prevention procedures.
REF	Denotes product/part number.
SN	Denotes product/serial number.
LOT	Denotes lot or batch number.
RATED	The acceptable wattage input range for this product.

	In accordance with European Community Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste but should be collected separately. **Note:** The device does not contain any hazardous materials. Legal regulations may include specifications regarding the disposal of this product. We request that you contact Stryker when you plan to withdraw this device from service for discard.

3. Tool List

3.1 Required Tools

- Genie lift or equipment lift, SLC-12 or equivalent
- Torpedo level
- Metric allen set (Shortened 3mm)
- Small and large phillips head
- Small and Large flat head screwdriver
- 24mm (15/16 inch) wrench
- Snap ring plier (adjustable to 15mm)
- Torque Wrench (in. lbs.)
- Torque Wrench (ft. lbs.)

3.2 Optional Tools

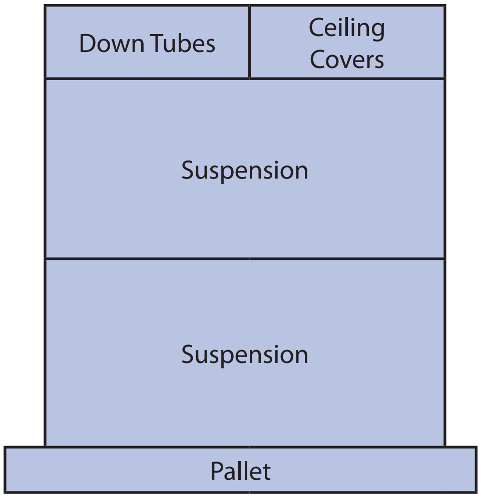
- Porta band saw
- Large hand file
- 1/2 inch Drill/Driver
- Tape measure
- Drill bit set
- Hand tool pouch
- Adjustable wrench
- Roofer's square

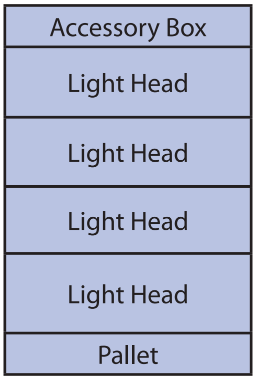
4. Unpacking

4.1 Halogen Light

Warning **Use caution when lifting heavy objects to avoid serious bodily injury or damage to the equipment.**

The equipment will arrive in shipping boxes on two separate pallets and may be arranged as depicted in the images below. The shipping boxes should contain all the necessary components required to install the halogen light system. Use the image and list below to determine where each component of the light suspension is packaged.


Down Tubes
Ceiling Covers
Suspension
Suspension
Pallet


Accessory Box
Light Head
Light Head
Light Head
Light Head
Pallet

4.1.1 Suspension Box

- Light Suspension
  - Suspension (Single, Dual, or Triple)
  - Spring Arms
  - Installation Hardware
  - Flat Panel Cable Kit

4.1.2 Accessory Box

- Wall Control Unit and Cable Kits
- Power Supply Box

4.1.3 Light Head Boxes

- Halogen light heads
- Light Handle Assemblies
- StrykeCam® In-Light Camera (if purchased)
- Sterilizable Light Handle
- Sterilizable Camera Handle (if StrykeCam was ordered)

If any parts are missing, contact the Shipping and Receiving Department to verify whether a shipping box(es) was left behind. If all boxes were delivered and parts are unaccounted for, call and inform your Project Manager of the missing items.

Use box cutters to open the shipping box along the seams.

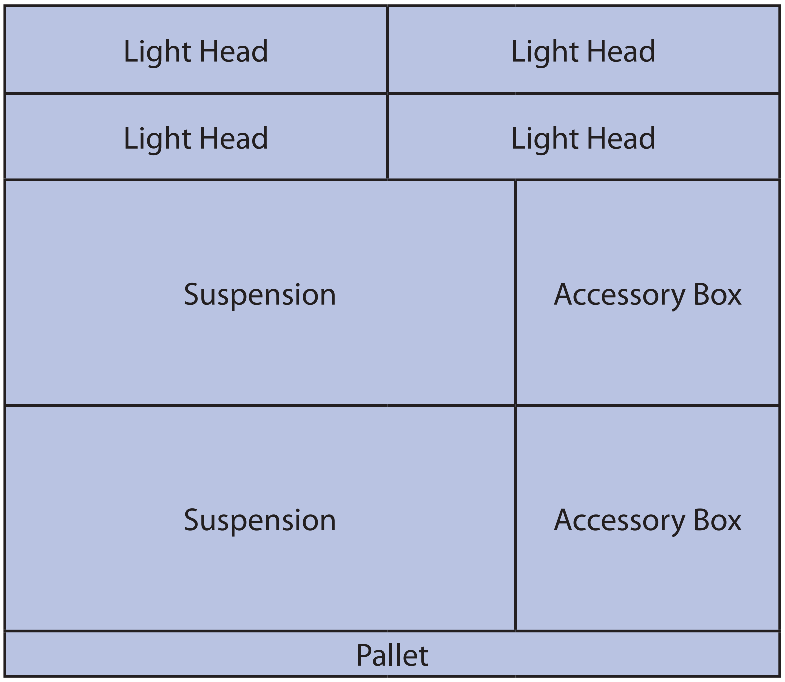
Note Notice that the boxes have "break away" panels to allow easy access to the parts.

Verify that all parts are present and visibly undamaged.

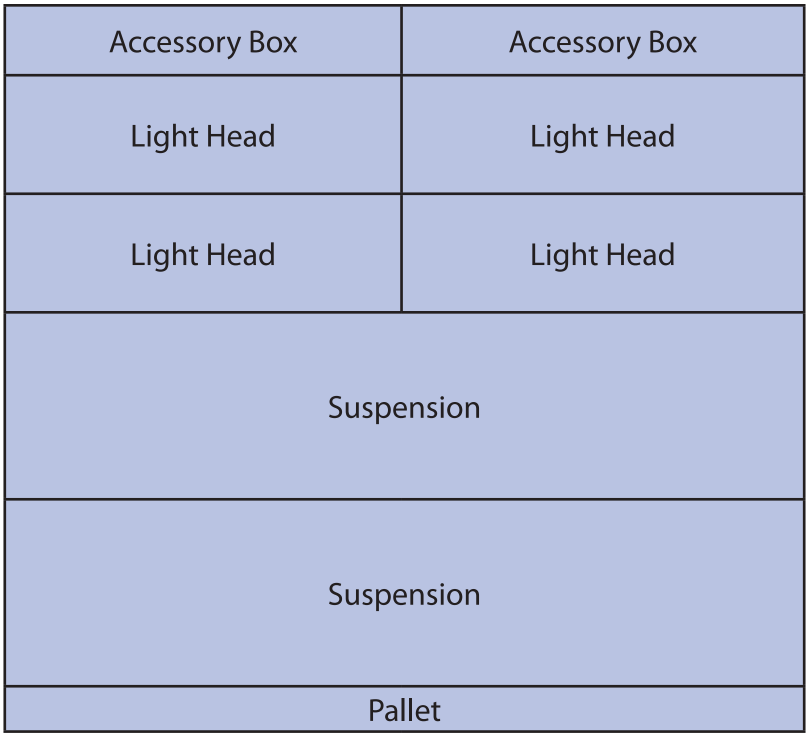
4.2 LED Light

Warning **Use caution when lifting heavy objects to avoid serious bodily injury or damage to the equipment.**

The equipment will arrive in shipping boxes and may be arranged as depicted in the image below. The shipping boxes should contain all the necessary components required to install the Visum® LED light system. Use the image and list below to determine where each component of the light suspension is packaged.


Light Head
Light Head
Light Head
Light Head
Suspension
Accessory Box
Suspension
Accessory Box
Pallet

**The outlined boxes represent a double shipment of supplies.*
Orientation of packaging may arrive differently.


Accessory Box
Accessory Box
Light Head
Light Head
Light Head
Light Head
Suspension
Suspension
Pallet

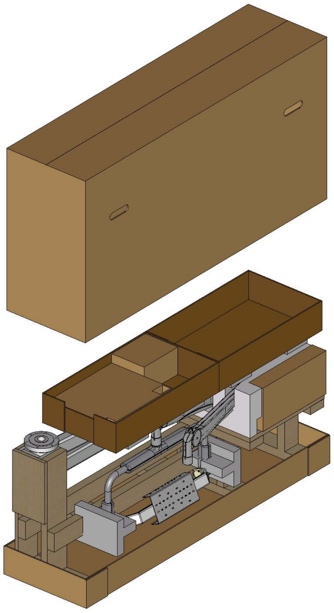
4.2.1 Suspension Box

- Light Suspension
  - Suspension (Single, Dual, or Triple)
  - Spring Arms
  - Installation Hardware
  - Flat Panel Cable Kit
  - Tea Cup (*EHA only*)

4.2.2 Accessory Box

(There are three boxes within the Accessory Box)

- Ceiling Cover (Box 1)
- Wall Control Unit and Light Cable Kits (Box 2)
- Power Supply Box and Bezel (Box 3)
- Down Tube



Extended Horizontal Arm Packaging

4.2.3 Light Head Boxes 1 and 2

- LED light heads
- Light Handle Assemblies
- StrykeCam® 2 In-Light Camera (if purchased)
- Sterilizable Light Handle
- Sterilizable Camera Handle (if StrykeCam 2 was ordered)

If any parts are missing, contact the Shipping and Receiving Department to verify whether a shipping box(es) was left behind. If all boxes were delivered and parts are unaccounted for, call and inform your Project Manager of the missing items.

Use box cutters to open the shipping box along the seams.

☞ **Note** Notice that the boxes have "break away" panels to allow easy access to the parts.

Verify that all parts are present and visibly undamaged.

4.3 Flat Panel Arms

The equipment will arrive in a shipping box on one pallet. The shipping box should contain the Flat Panel Arm System and Ceiling Covers.

The Flat Panel Arm will be fully assembled and completely wired out of the crate. Uncrate pallet and open the shipping box.

Use box cutters to open the shipping box along the seams.

Verify that all parts are present and visibly undamaged.

4.4 Booms

Each Boom will arrive in a shipping box on one pallet. The shipping box should contain a Boom Arm, Service Head, shelves (if applicable), and Ceiling Covers.

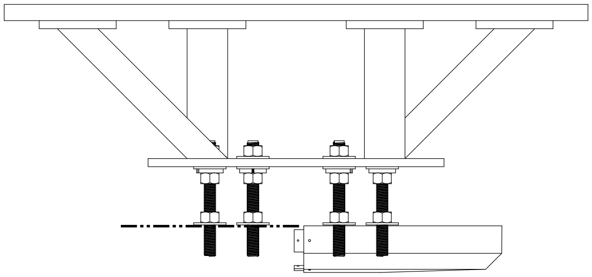
Use box cutters to open the shipping box along the seams.

Verify that all parts are present and visibly undamaged.

5. Preparing the Mounting (Interface) Plate

Remove the hardware bag from the suspension box.

Note Ensure all-thread rods do not interfere with the application of ceiling cover by performing a dry fit. The all-thread rods should not extend below the base of the cover. If they do, cut the rods back.



1. Install six hex nuts below Mounting (Interface) Plate to align flange top approximately even with the bottom of finished ceiling.
2. Use a Torpedo Level to verify that the nuts are level. Measure two sets at a time.
3. Place flat washers and Plastic Isolation Discs (required in Europe) below each hex nut to hold in place.

Note Plastic Isolation Discs are only required in Europe.

Caution No more than 8 inches of exposed all-thread rod is allowed between the Pre-installation Plate and the down tube flange for Seismic considerations. No more than 2 inches of exposed all-thread rod is allowed for Zone 4 installations.

Cover Size	
180 mm (7 inches)	153 mm (6 inches)
80 mm (3 inches)	64 mm (2.5 inches)

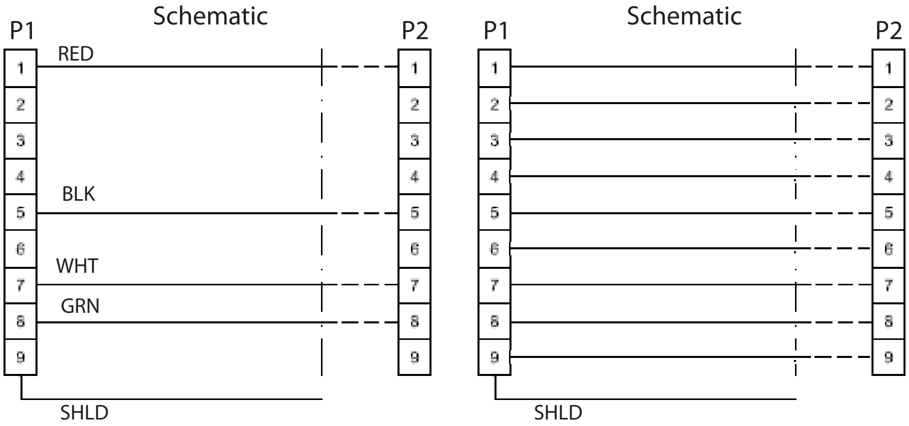
6. Preparing the Suspensions

6.1 Installing the Cable Kit for Lights

1. Route the power and control cables between the power supply box and the suspension structure.
   Verify that the light connectors remain near the ceiling plate, as shown in the figure below.
2. (For LED only) Route the S-Video cable through the pre-installed conduit between the super structure and video output location.

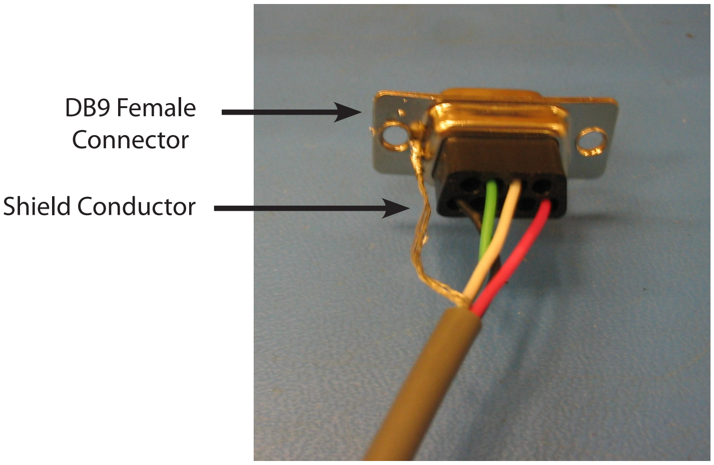
Note Consult your Project Engineer and/or room drawings to determine the video output location.

3. Pull the cable between the wall control unit and the power supply box.
   One end of the wall control unit cable is unterminated.
4. Cut the wall control unit cable to length and terminate it. Connect the wires into the female connector according to the schematic chart shown below.


Schematic
P1
P2
RED
BLK
WHT
GRN
SHLD
1
2
3
4
5
6
7
8
9
Schematic
P1
P2
SHLD

Wall Control Unit Cable Pin Configuration - LED (left) Halogen (right)

5. Solder the Shield Conductor to the DB9 female connector chassis as shown below.


DB9 Female Connector
Shield Conductor

Soldered Shield Conductor

6.2 Surgical Lights

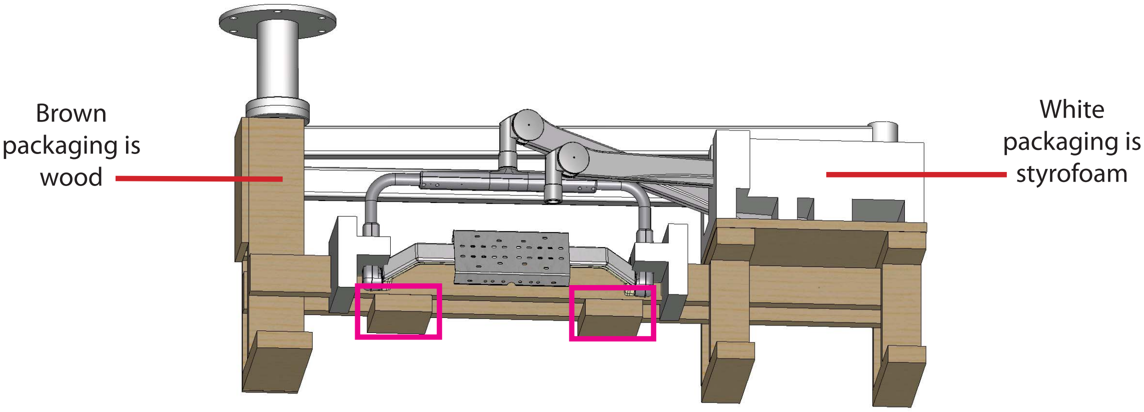
6.2.1 Standard Horizontal Arm

1. Load the suspension shipping box onto a heavy machinery lift device.
2. Cut cardboard 9 inches from the top of the box to facilitate hanging suspension. Be careful not to cut cables or scratch the suspension.
3. Mount down tube onto suspension. Use the six flat head socket cap screws (taped to down tube) to attach the down tube to the central axis spindle. Tighten all screws with a torque wrench set to 100 lb-in (8.33 lb-ft, 11.3 Nm). Once all screws have been tightened, **retighten** each screw to ensure correct torque is set.

   If you are installing a flat panel along with a dual light suspension, verify that the flat panel cable kit is routed through the opening in the down tube.
4. Position the suspension assembly directly below the mount site.
5. Go to Section 7, "Installing the Suspension" to complete installation.

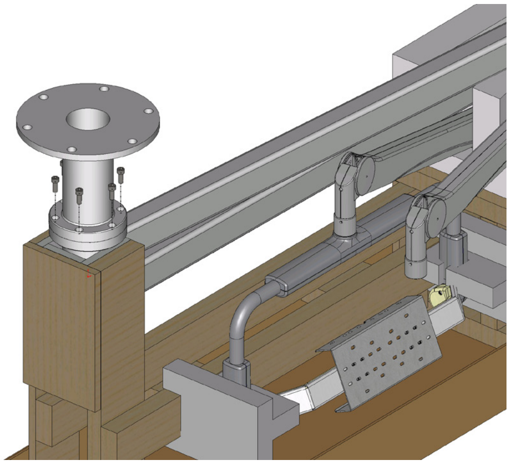
6.2.2 Extended Horizontal Arm

1. Remove all accessories and the cardboard box.
2. Position Genie Life so that forks are underneath the highlighted areas shown in the following figure.



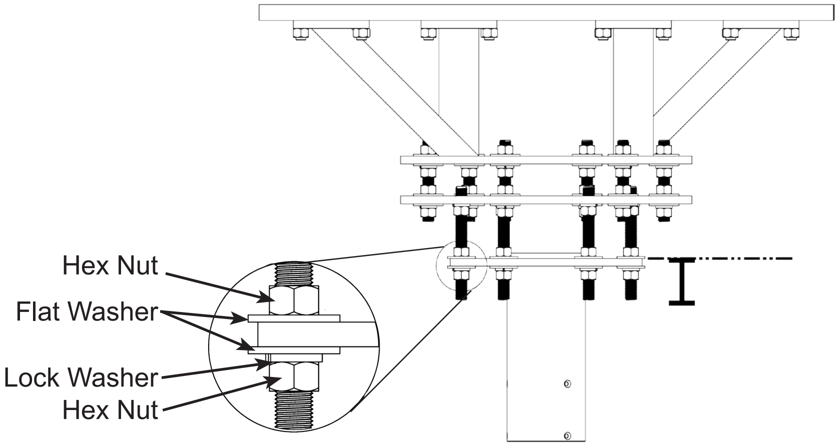
3. Mount down tube onto suspension. Use the six socket cap screws to attach the down tube to the central axis spindle. Tighten all screws with a torque wrench set to 354 lb-in (29.5 lb-ft, 40 N-m). Once all screws have been tightened, retighten each screw to ensure correct torque is set.

   If you are installing a flat panel along with a dual light suspension, verify that the flat panel cable kit is routed through the opening in the down tube.
4. Position the suspension assembly directly below the mount site.



6.2.3 Alternate Light Installation Instructions

1. Load the suspension shipping box onto a heavy machinery lift device.
2. Cut cardboard 9 inches from the top of the box to facilitate hanging suspension. Be careful not to cut cables or scratch the suspension.

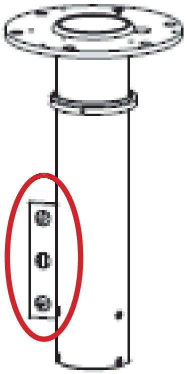


Note When necessary, Plastic Isolation Discs surround the mounting plate, but are only required in Europe.

3. Raise the down tube toward the mount site.
4. Guide the all-thread rods through the holes located on the down tube flange.

   The down tube flange must press lightly against the hardware assembly.

5. Place a flat washer on alternating all-thread rods followed by a hex nut; tighten the hex nut.
6. Use a Torpedo Level to verify the down tube flange is level across three horizontal planes. If the flange is not level, adjust the hex nuts until the Torpedo Level indicates the down tube flange is level across three horizontal planes. Confirm that the down tube is also level by placing the Torpedo Level on the down tube at three, evenly-spaced locations.



7. Install a flat washer, lock washer, and hex nut on the remaining all-thread rods.

Note Plastic Isolation Discs are only required in Europe.

8. Tighten the hex nuts to 75 ft-lbs. Ensure the lock washers are fully compressed.
9. Remove the hex nuts from the all-thread rods applied in step 5 and install a lock washer and hex nut.

10. Use a Torpedo Level to verify that the down tube flange is level across three horizontal planes.
11. Connect the ground wire (found on the down tube flange) to the ground lug located in the ceiling.
12. Refer to Section 7 to complete installation.

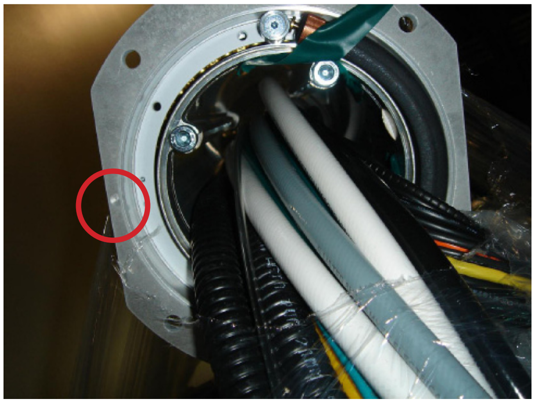
6.3 Flat Panel

1. Place the suspension onto a heavy machinery lift device.
2. Use zip ties to tie the horizontal arm and Spring Arm together to prevent swinging during installation.
3. Raise the Flat Panel Arm for installation; position the arm so the stop is in the specified location (the Project Manager should have this information).

Note The normal stop position is above the bed, allowing 330° of rotation of the upper arm, with the 30° “dead” spot.

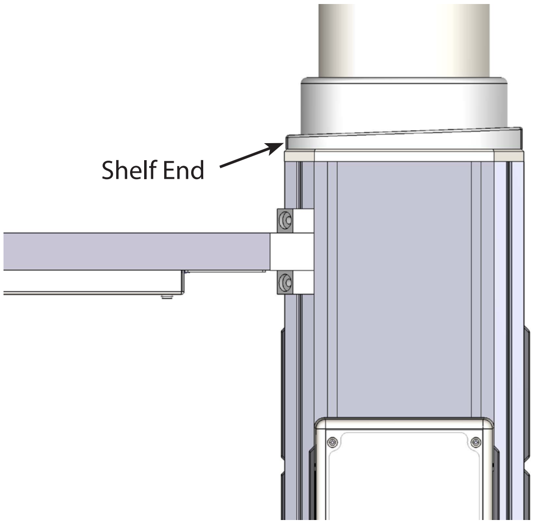
6.4 Booms

Due to door entry height, the flange and drop tube may be removed for entry into the room. The flange and drop tube must be reinstalled before installation of the equipment boom.



If the MMP200/OSC600 Service Head is not assembled:

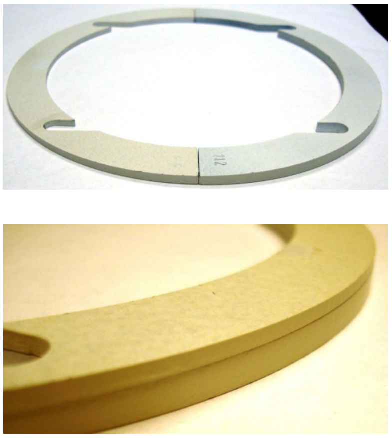
1. Place pallet securely on material lift (e.g., Genie Lift).
2. Determine the orientation of the service head before attaching to the down tube, feel for the notch. The notch will be mounted to the front of the service Head.



3. Remove the four Allen screws from the Service Head using a 5mm Allen wrench.
4. Locate the cable kit end and pass through the service head opening.

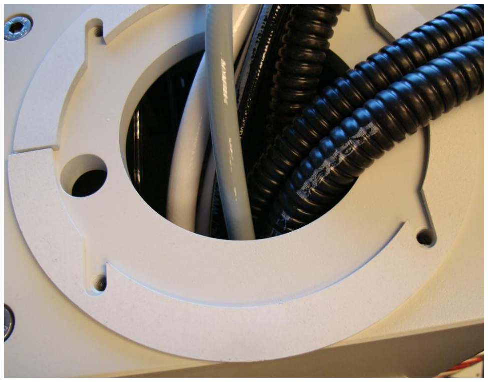
MMP200 only

> **Note** The Shelf Wedge kit has a thick and a thin component. Orientation of the thin side towards the front of the service head is important.



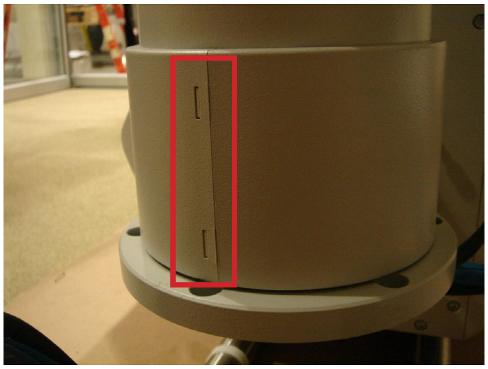
0682-001-345 Wedge Kit

5. Verify which Wedge is the thinner wedge of the 2 halves of the Wedge Kit
6. Place the thinner Wedge towards the front of the Service Head



7. Place the thicker Wedge towards the rear of the Service Head.
8. Connect Service Head to articulating arm.
9. Tighten the four Allen screws to 14.75 lb-ft (20 Nm) using a 5mm Allen wrench.
10. s

If the OSC400 Service Head is not assembled:



1. Remove the six (6) Allen screws from the Service Head using a 5mm Allen wrench.
2. Remove the cylinder cover located on the Down Tube. The two (2) halves can be detached by depressing on the two (2) clips with a flat edge tool.
3. Rotate the Down Tube and determine the stop location. This point will be installed to the front of the service head.
4. Locate the cable kit end and pass through the service head opening. In some cases, half of the pass-thru plate will need to be removed to feed the cable kit completely through.

⚠ **Caution** **Be sure to leave enough slack for the EP Module control cable within the arm set. Failure to do so may result in damage to the cable upon removal of the EP module.**

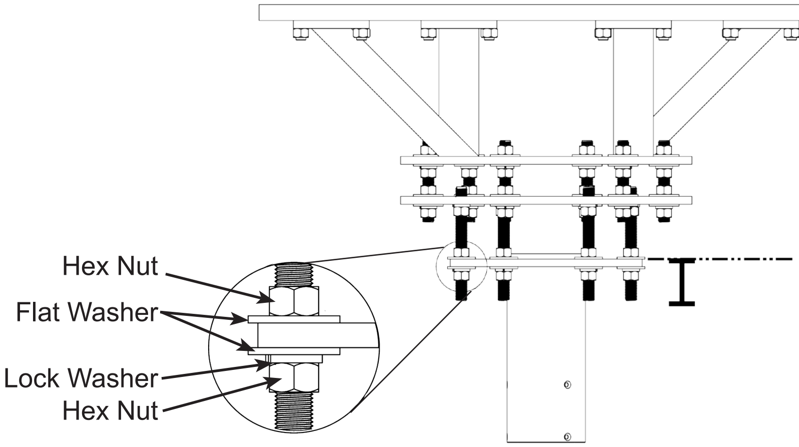
5. Attach the service head by inserting and tightening the six (6) Allen screws to 7.4 lb-ft (10 Nm) using a 5mm Allen wrench.

6.5 Routing Cables

This section is only applicable to suspensions with lengthy cable kits.

1. Uncoil the cable kit.
2. Pull the cables from the suspension through the top of the mounting interface plate.
3. Continue to route the cable through the ceiling conduits. Consult your Project Engineer and/or room drawings to determine cable routing through the conduits.

7. Installing the Suspension and Boom Arms

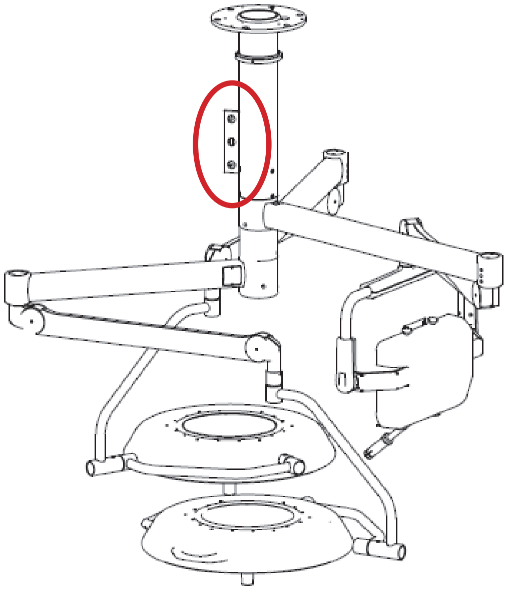


Note When necessary, Plastic Isolation Discs surround the mounting plate, but are only required in Europe.

1. Raise the Suspension assembly toward the mount site.
2. Take care when raising the suspension to prevent pinching cables between the all-thread rods and down tube.
3. Guide the all-thread rods through the holes located on the down tube flange.

   The down tube flange must press lightly against the hardware assembly.

4. Pull all cables and electrical connections through the Mounting (Interface) Plate. If ORIS connectivity is going to occur at a later date, tie-wrap cable kit to down tube flange.
5. Place a flat washer on alternating all-thread rods followed by a hex nut; tighten the hex nut.
6. Use a Torpedo Level to verify the down tube flange is level across three horizontal planes. If the flange is not level, adjust the hex nuts until the Torpedo Level indicates the down tube flange is level across three horizontal planes. Confirm that the down tube is also level by placing the Torpedo Level on the down tube at three, evenly-spaced locations.



7. Install a flat washer, lock washer, and hex nut on the remaining all-thread rods.

Note Plastic Isolation Discs are only required in Europe.

8. Tighten the hex nuts to 75 ft-lbs. Ensure the lock washers are fully compressed.
9. Remove the hex nuts from the all-thread rods applied in step 10 and install a lock washer and hex nut.
10. Use a Torpedo Level to verify that the down tube flange is level across three horizontal planes.
11. Connect the ground wire (found on the down tube flange) to the ground lug located in the ceiling.
12. Lower the lift device and check the suspension for stability.
13. Pull excess cable through conduit.

7.1 Alternate Light Installation Instructions (Continued)

1. Using a lift device, raise the suspension into the down tube.
2. Pull all cables and electrical connections through the Mounting (Interface) Plate. If ORIS connectivity is going to occur at a later date, tie-wrap cable kit to down tube flange.
3. Pull excess cable through conduit.
4. Mount down tube onto suspension. Use the six flat head socket cap screws (taped to down tube) to attach the down tube to the central axis spindle. Tighten all screws with a torque wrench set to 100 lb-in (8.33 lb-ft, 11.3 Nm). Once all screws have been tightened, **retighten** each screw to ensure correct torque is set.

Note **For EHA** - Tighten all screws with a torque wrench set to 354 lb-in (29.5 lb-ft, 40 N-m).

If you are installing a flat panel along with a dual light suspension, verify that the flat panel cable kit is routed through the opening in the down tube.

5. Take care when raising the suspension to prevent pinching cables between the down tube and suspension.

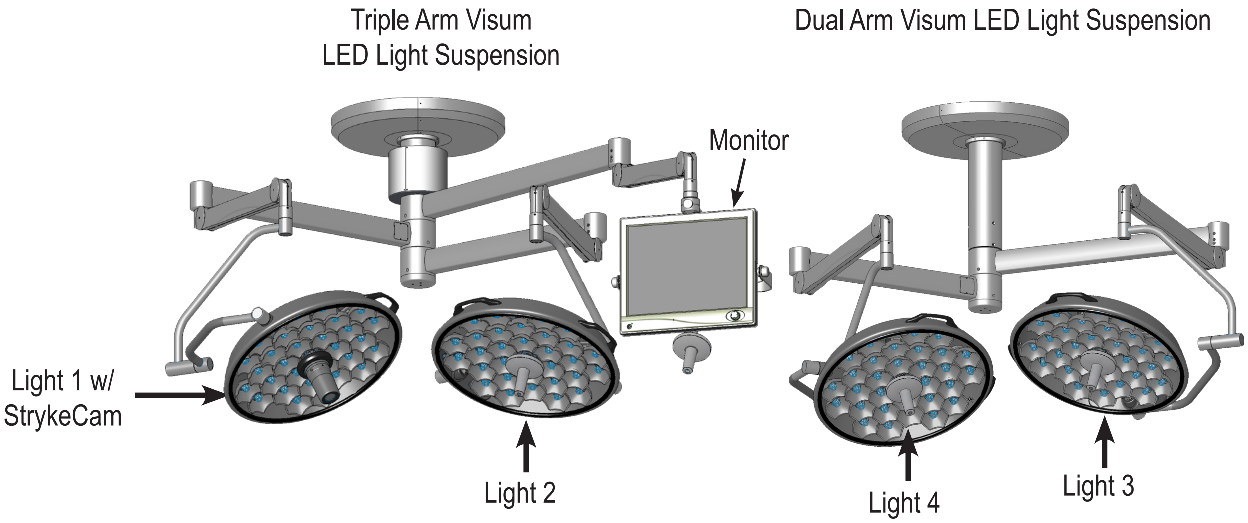
8. Installing Light Heads

8.1 LED and Halogen

Always install the light heads before installing the light handle assembly and In-Light Camera. The camera light head must be installed on the uppermost Light Spring Arm.

In the case of LED only, the physical difference between a 5-pole Spring Arm and a 9-pole Spring Arm is that the 5-pole slip ring is keyed and the 9-pole slip ring is not. The keys resemble rectangles when viewed from the end of the slip ring.

> **Note** Two people should lift the light head to attach it to the Spring Arm.



Visum LED Light Suspension

> **Note** StrykeCam 2 is always associated with Light 1 and is always installed above Light Head 2.

8.1.1 Standard Light

8.1.1.1 5-Pole Light Head

1. Locate the 5-pole Spring Arm and remove the M3 screw.
2. Slide the Safety Segment Cover up to reveal the Safety Segment and re-insert the M3 screw to hold the cover up.
3. Remove the Safety Segment.
4. Install the 5-pole Light Head.
   a. Align the top of the Cardanic Suspension with the bottom of the Spring Arm.
   b. Align the rectangle-like keys along the outer wall of the 5-pole slip ring, (located in the light head) with the notches of the Spring Arm Slip Ring.
   c. Raise the light head into the Spring Arm.
5. Reinstall the Safety Segment.

  a. Remove the M3 screw and slide the Safety Segment Cover down.
  b. Re-insert and tighten the M3 screw to keep the cover in place.

⚠ **Warning** **Failure to tighten this screw can cause the Safety Segment Cover to slide and the light head to fall from the Spring Arm.**

8.1.1.2 9-Pole Light Head (LED Only)

1. Locate the 9-pole Spring Arm and remove the M3 screw.
2. Slide the Safety Segment Cover up to reveal the Safety Segment.
3. Remove the Safety Segment.
4. Align the top of the Cardanic Suspension with the bottom of the Spring Arm.
5. Install the 9-pole Light-Head.

☞ **Note** The 9-pole slip ring is not keyed.

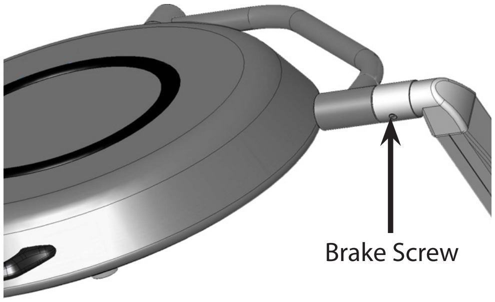
6. Raise the light head into the Spring Arm.
7. Reinstall the Safety Segment.
   a. Slide the Safety Segment Cover down.
   b. Tighten the M3 screw to keep the cover in place.

⚠ **Warning** **Failure to tighten this screw can cause the Safety Segment Cover to slide and the light head to fall from the Spring Arm.**

8.1.2 Low Ceiling Light

8.1.2.1 Low Ceiling 5-Pole Light Head

1. Locate the 5-pole Spring Arm and remove the brake screw.



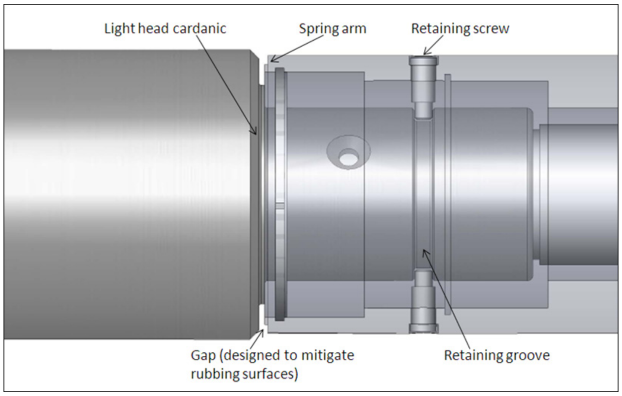
2. Rotate the cuff 90° to reveal the first retaining screw. Remove the retaining screw from the Spring Arm.
3. Rotate the cuff 180° to reveal the second retaining screw. Remove the retaining screw from the Spring Arm.
4. Install the 5-pole Light Head.
   - Align the rectangle-like keys along the outer wall of the 5-pole slip ring (located in the light head) with the notches of the Spring Arm slip ring.

- Insert the light head into the Spring Arm. Make sure to support the Spring Arm when assembling.

5. Reinsert the retaining screws removed in steps 2 and 3.

⚠ **WARNING** **The cuff must be in place before installing the retaining screws.**

- Align the retaining ring groove feature on the Cardanic of the light head with the retaining screw holes in the spring arm. A gap will be present between the face of the Cardanic and face of the spring arm when properly aligned. If needed, back the light head out slightly.



⚠ **Caution** **Tightening the retaining screws into the wall of the Cardanic without aligning them into the retaining ring groove may damage the surface of the Cardanic.**

- Place the first retaining screw through the opening of the cuff and reinstall it. Tighten the screw completely to ensure that the cuff will still rotate freely.
- Rotate the cuff 180° to reinstall the second retaining screw. Tighten completely.

⚠ **Caution** **Over tightening the Low Ceiling light head to Spring Arm brake screw can cause permanent damage to the light**

- Rotate the cuff 90° to insert the brake screw back into place. Tighten the screw until the light head constantly holds the position in which it is placed.
- When adjusting the brake screw after installing the light for the first time or any time after performing preventative maintenance, adjust the brake screw and rotate the joint through a minimum of five rotations. If after five rotations the joint becomes difficult to rotate, the brake screw is over tightened and needs to be readjusted.

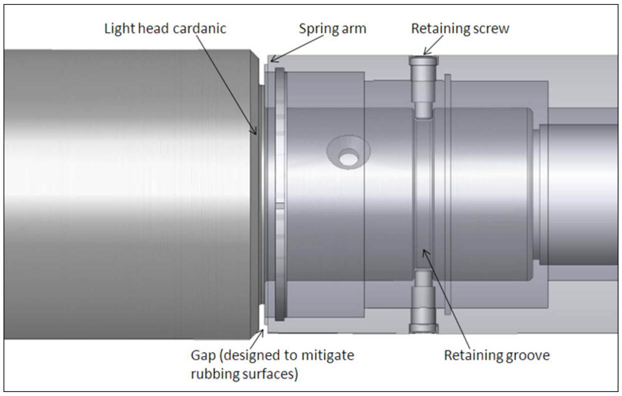
8.1.2.2 Low Ceiling 9-Pole Light Head

1. Locate the 9-pole Spring Arm and remove the brake screw.
2. Rotate the cuff 90° to reveal the first retaining screw. Remove the retaining screw from the Spring Arm.
3. Rotate the cuff 180° to reveal the second retaining screw. Remove the retaining screw from the Spring Arm.
4. Install the 9-pole light head. Make sure to support the Spring Arm when assembling.

Note The 9-pole slip ring is not keyed.

WARNING **The cuff must be in place before installing the retaining screws.**

5. Reinsert the retaining screws removed in steps 2 and 3.
    - Align the retaining ring groove feature on the Cardanic of the light head with the retaining screw holes in the spring arm. A gap will be present between the face of the Cardanic and face of the spring arm when properly aligned. If needed, back the light head out slightly.



Caution **Tightening the retaining screws into the wall of the Cardanic without aligning them into the retaining ring groove may damage the surface of the Cardanic.**

- Place the first retaining screw through the opening of the cuff and reinstall it. Tighten the screw completely to ensure that the cuff will still rotate freely.
- Rotate the cuff 180° to reinstall the second retaining screw. Tighten completely.

Caution **Over tightening the Low Ceiling light head to Spring Arm brake screw can cause permanent damage to the light**

- Rotate the cuff 90° to insert the brake screw back into place. Tighten the screw until the light head constantly holds the position in which it is placed.
- When adjusting the brake screw after installing the light for the first time or any time after performing preventative maintenance, adjust the brake screw and rotate the joint through a minimum of five rotations. If after five rotations the joint becomes difficult to rotate, the brake screw is over tightened and needs to be readjusted.

9. Powering the System

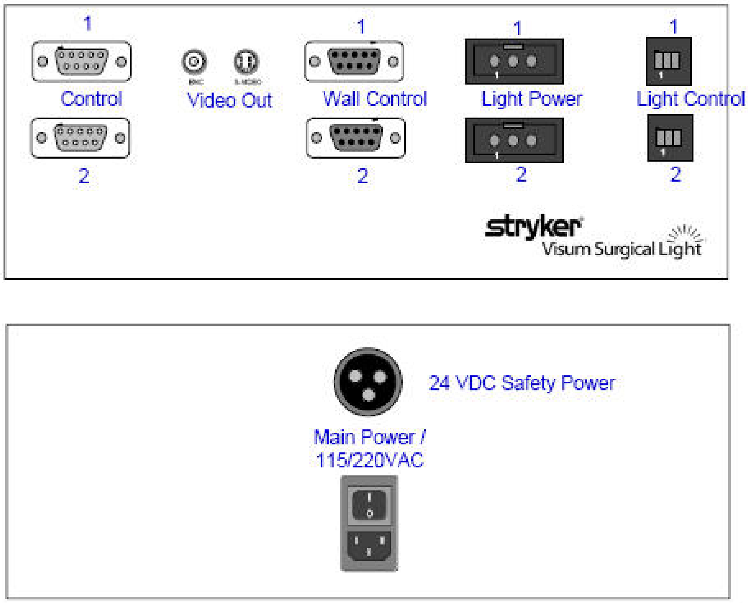
9.1 Halogen Lights

9.1.1 Electrical and Data Connections

The electrical system consists of the following parts:

- Wall control box
- Power supply box
- Electronics in light head

1. Mount the wall control box into back box and connect the two cables. Top cable is for Light One (black connector), bottom connection is for Light Two (white connector) and the camera controls.
2. Place the power supply box into designated the location in the documentation station. The front of the power supply box has the video connections, RS-232 connections, and the low voltage connections to the lights. The rear has an IEC connector for 115/230VAC power cord. Additionally a 24VDC safety power connection is provided for countries with this requirement.



Power Supply Box (Front and Rear View)

> **Note** Proper positioning of the light Power supply box in the Documentation Station with cable connections in the front.

3. Connect the two cables from the wall control box to the proper connectors.
4. Connect the surgical lighting low voltage and listen for an audible click to confirm proper installation.
5. Connect the data cables to the power supply box.
6. Connect hospital-provided 24 VDC backup power to provided connector (if applicable).

> **Note** Have the hospital designated contractor connect the high voltage cord to the junction box they installed for Light/ Flat Panel models only. Stryker will not make high voltage connections. Do not close the circuit breaker yet.

7. Connect low voltage leads from the power supply box to connections at the top of the surgical lighting suspension.

8. Verify all electrical connections are made, then have contractor turn breaker back on. Power up the lights using the wall box.
9. Run lights through control, checking the following order:
    a. On/off (10 times each light head).
    b. Intensity up and down through the full range (10 times per light head).
    c. Verify reserve bulb indicator is operational by removing the primary bulb from each light head. The reserve bulb indicator on the wall control panel should light up. Replace primary bulb after turning off the lights.

⚠ **Caution** **DO NOT touch the bulb directly with your hands.**

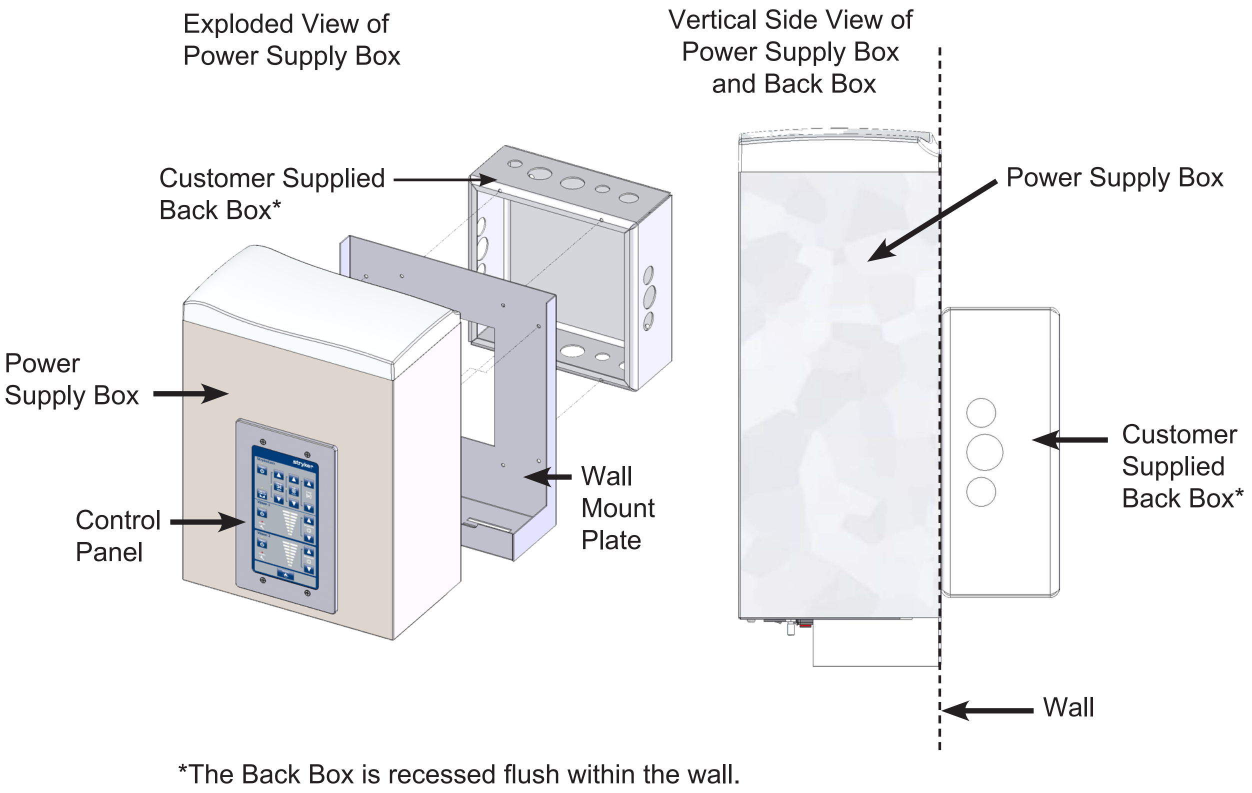
9.2 LED Lights

9.2.1 Power Supply Box Wall Mount (Optional)

The power supply box wall mount should be used to securely install and mount a Visum LED power supply box to a wall.

Mount a standard Hubbell Wiegmann (P/N SC101004) junction box to a wall and then install the power supply box.

☞ **Note** Consult the hospital to determine ideal placement for a power supply box before mounting the junction box.



Exploded View of Power Supply Box
Vertical Side View of Power Supply Box and Back Box
Customer Supplied Back Box*
Power Supply Box
Power Supply Box
Control Panel
Wall Mount Plate
Customer Supplied Back Box*
Wall

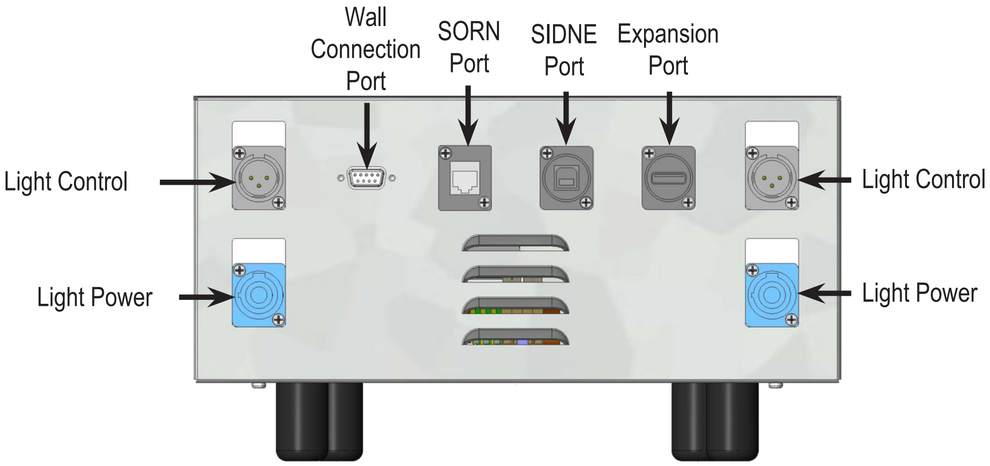
*The Back Box is recessed flush within the wall.

Exploded/Side view of Power Supply Box

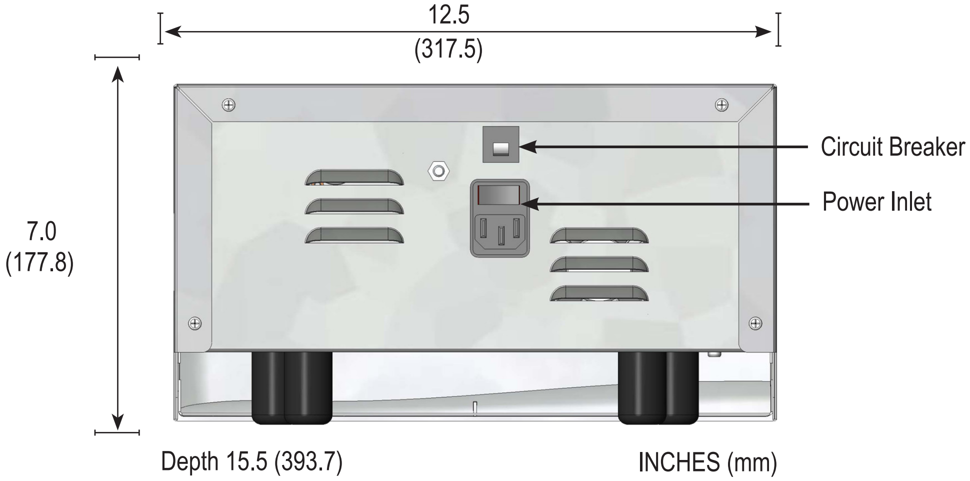
9.3 Power Supply Box Connections

Place the power supply box in the designated location in the documentation station.

The front of the power supply box has RS-232 and low voltage connections. The power inlet connector is located on the rear side of the power supply box for the 115/230VAC power cord.


Wall Connection Port
SORN Port
SIDNE Port
Expansion Port
Light Control
Light Control
Light Power
Light Power

Power Supply Box, Front View

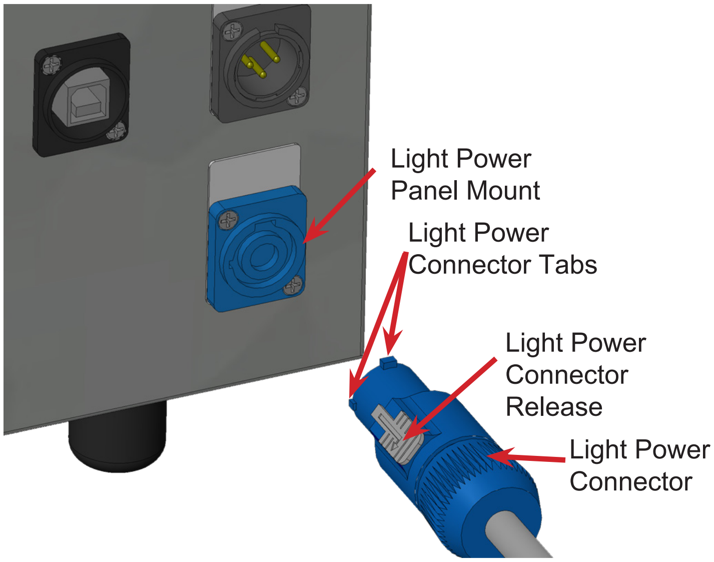

12.5
(317.5)
7.0
(177.8)
Circuit Breaker
Power Inlet
Depth 15.5 (393.7)
INCHES (mm)

Power Supply Box, Rear View

Note Avoid blocking the fan exhausts or placing objects within 2 inches of the fan exhausts.

To control the Visum LED Surgical Light and StrykeCam 2 In-Light Camera from the wall-mounted control panel, the Light Power Connector and Wall Control Connector must be connected to a power supply box. Review the sets of instructions and diagrams below for connections.

9.3.1 Power

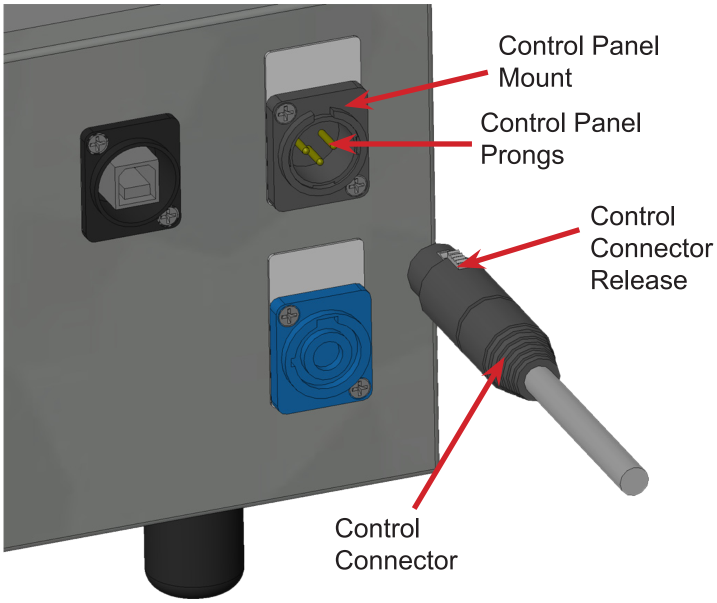

Light Power
Panel Mount
Light Power
Connector Tabs
Light Power
Connector
Release
Light Power
Connector

Power Supply Box Light Connections

1. Align the Power Connector Tabs with the slots on the Light Power Panel Mount.
2. Insert the Power Connector into the mount and turn it clockwise until you hear a click.

   This ensures that the connection is secure.

9.3.2 Control


Control Panel
Mount
Control Panel
Prongs
Control
Connector
Release
Control
Connector

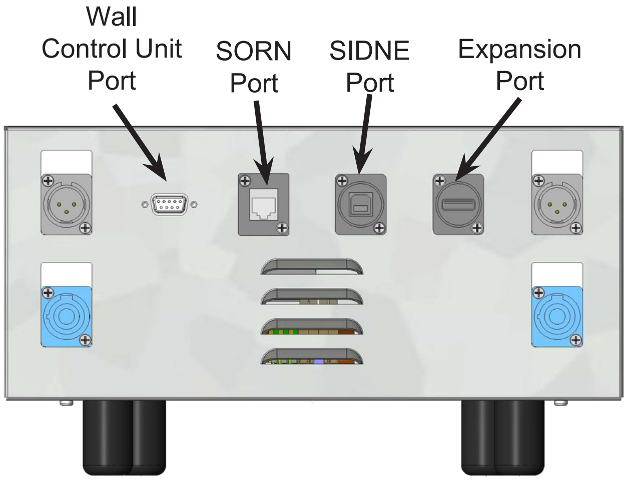
Power Supply Box Control Connections

1. Align the prongs on the Control Panel Mount with the slots on the Control Connector.

   The prongs must fit into the slots on the Control Connector.
2. Insert the Control Connector into the Control Panel Mount and press until you hear a click.

   This ensures that the connection is secure.

9.3.3 Wall Control Unit Port



See the diagram and instructions below to set up and connect the following ports:

- Wall Control Unit Port
- SORN Port
- SIDNE Port
- Expansion Port

Connection Ports

To enable a connection between the wall-mounted control panel, Visum LED Surgical Lights, and StrykeCam 2 In-Light Camera, connect the Wall Control Unit Port on the power supply box to the wall-mounted control panel. Use a Stryker-supplied cable to connect the Wall Control Unit Port to the Wall Mounted Control Panel.

9.3.4 SORN

SORN is a system that enables device management and networking capability among Stryker equipment. Use an **Ethernet or CAT 5e cable** to connect the SORN port on the power supply box to a local hospital network port.

9.3.5 SIDNE

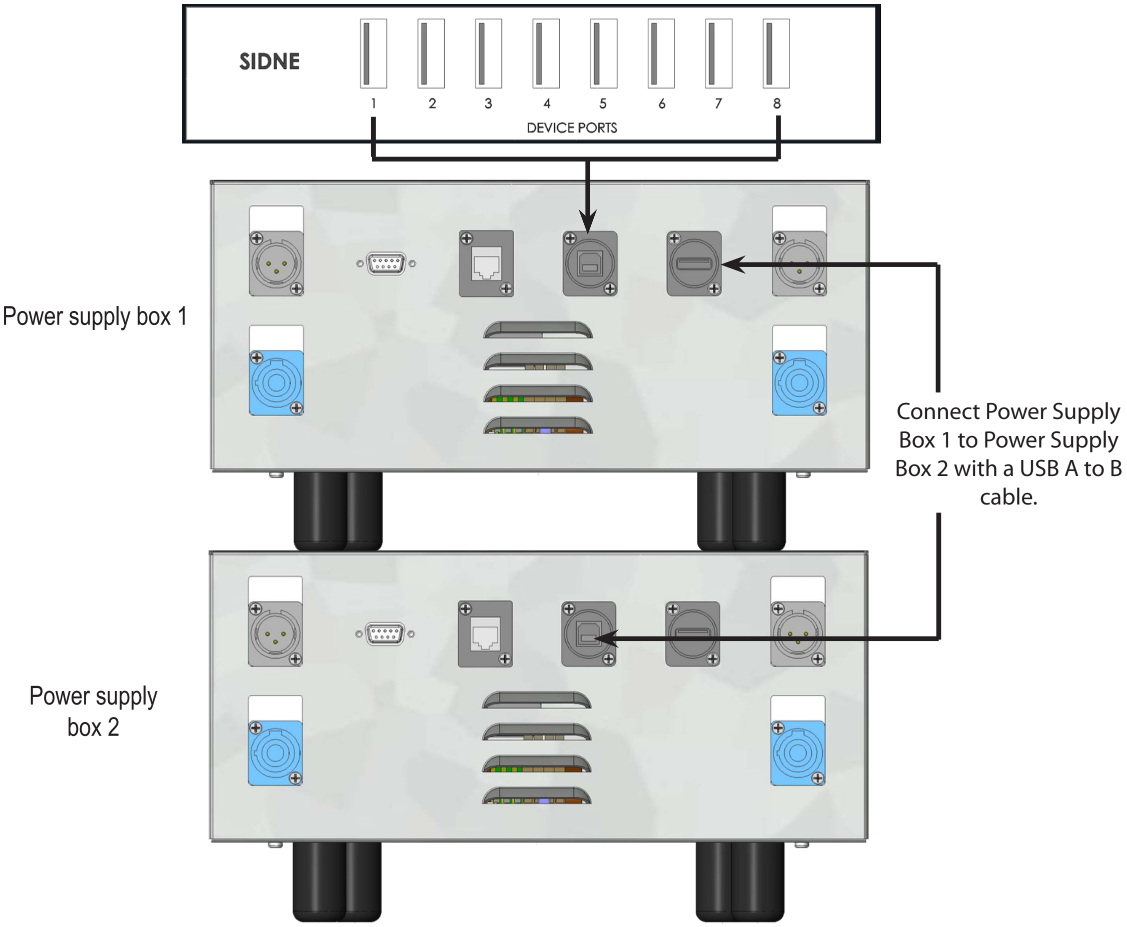
SIDNE is a voice activation platform that enables an operation room and its equipment to be controlled with voice commands. Use a USB A (male) to B (male) cable to connect SIDNE to the power supply box.

9.3.6 Expansion Port (Optional)

SIDNE can control up to four Visum LED Surgical Lights. To do this, a second power control box is necessary. Use the Expansion port on the first power supply box to connect a second power supply box to control the additional two lights.

To enable SIDNE to control four surgical lights:

1. Connect the *USB A to B* cable from an available SIDNE device port to the SIDNE port on the first power supply box.
2. Insert a second *USB A to B* cable into the Expansion Port on power supply box 1.
3. Connect the cable (leading from the Expansion port) to the SIDNE port on the second power supply box (see diagram below).


SIDNE
1
2
3
4
5
6
7
8
DEVICE PORTS
Power supply box 1
Power supply box 2
Connect Power Supply Box 1 to Power Supply Box 2 with a USB A to B cable.

Dual Power Supply Box for Multiple Light Control

> ⚠ **Caution** **Do not connect the SIDNE device port directly to power supply box 2.**

4. Connect the power supply box to 110V/230VAC using a medical grade power cord (included with shipment).
5. Connect the BNC female connectors to the BNC male connectors at the top of the suspension to establish the S-Video connection.

9.4 Visum LED New Installation Setup

9.4.1 Required Tools

- Laptop with a RS-232 COMM Serial Port
- USB to RS-232 Serial Adapter (0682-400-030; if no Serial Port is present on laptop)
- USB to RS-232 Serial Install Driver
- Visum LED Field Service and Installation Cable (0682-001-691)
- Windows Hyperterminal or other terminal program

9.4.2 Installing USB to RS-232 Adapter (for laptops without Serial Ports)

1. Insert Driver CD.

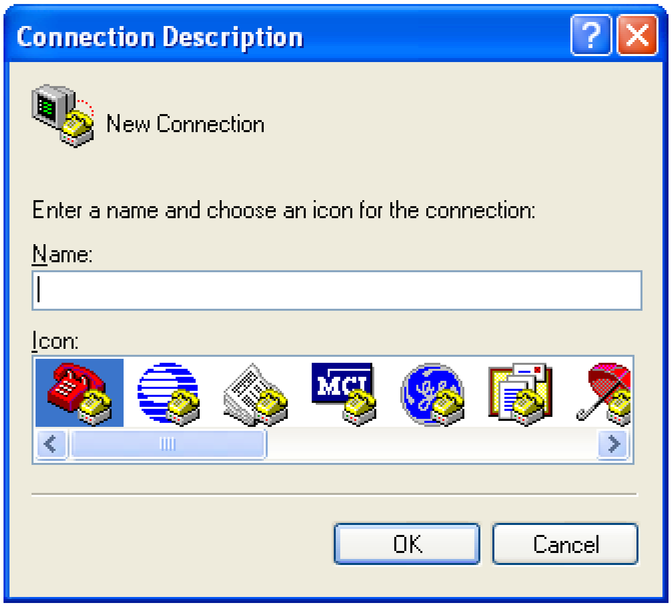
2. A Driver and User’s Guide window may appear. Close the window. Do not install from this window.
3. Connect the USB to Serial Adapter. The Found New Hardware Window should open.
4. Select - **No, not this time**.
5. Click **Next**.
6. Select - **Install from a list of specific location (Advanced)**. Click **Next**.
7. Select - Search for the best driver in these locations. Make sure to include the CD-ROM drive by checking the box that says “**Search removable media (floppy, CD-ROM...)**.” Click **Next**.
8. Wait while Windows searches for Drivers.
9. Select Appropriate Driver (if using Windows XP/2000 the highlighted driver shown in below). Make sure to select “**usb 2.0 to RS-232 converter**.” DO NOT select cable. Click **Next**.
10. Click **Finish**.
11. The Found New Hardware Window will appear again. Repeat Steps 4 through 9 once again selecting the ‘**usb 2.0 to RS-232 converter**’ and NOT the cable.
12. The USB to RS-232 Serial Adapter is now installed.

9.4.3 Connecting a Laptop to the SIDNE Port on Visum LED System

> **Note** Make sure system is completely connected and fully functional. Failure to do so may result in improper setup.

1. Insert the USB-B end of the Visum LED Field Service and Installation Cable into the SIDNE port on the Visum LED power supply box.
2. Insert the DB-9 end of the cable into the Serial port of your laptop (or Serial to USB adapter).
3. Power ON the Visum LED power supply box.

9.4.3.1 Launch Hyperterminal



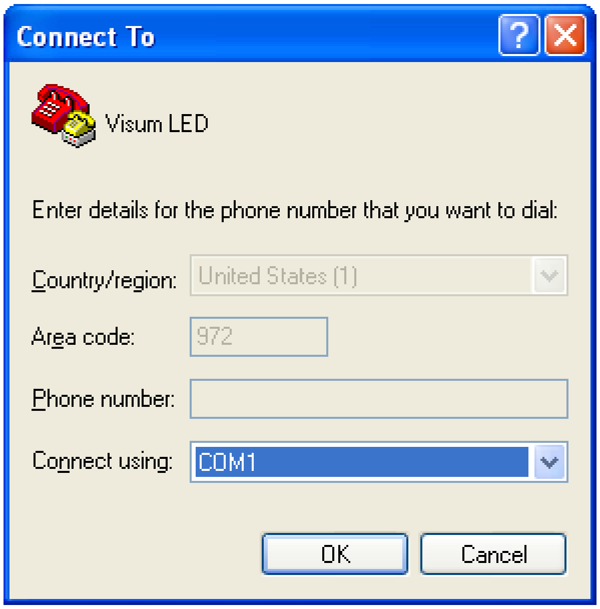
Enter a name and choose an icon for the connection:

Connection Description Dialog

1. Boot up the laptop and login.
2. Select Windows Start, Programs, Accessories, Communications, Hyperterminal.

   The Connection Description dialog should display.
3. Enter <VISUM LED> in the **Name** field.
4. Click **OK**.

   The **Connect To** dialog box displays.


Connect To
OK
Cancel

Visum LED

Enter details for the phone number that you want to dial:

Country/region: United States (1)

Area code: 972

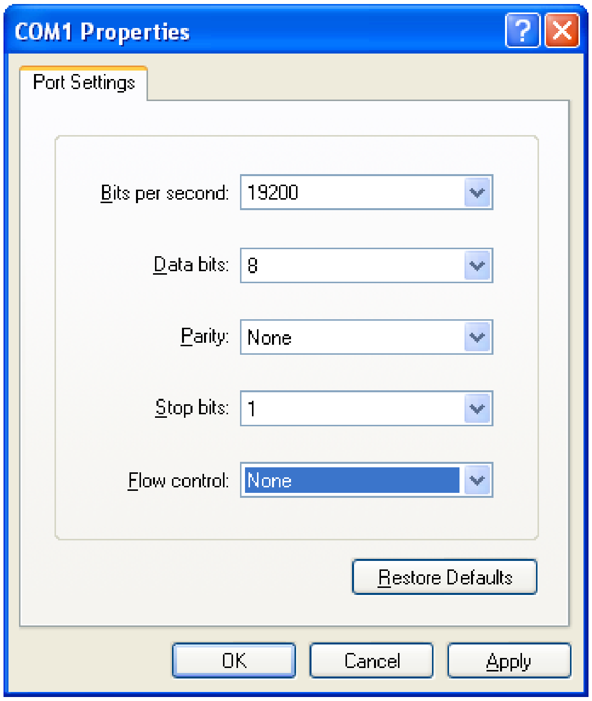
Phone number:

Connect using: COM1

Connect To Dialog

5. Select a COM Port in the **Connect Using** field and click **OK**.

   A COM Properties Window displays.


COM1 Properties
Port Settings
Restore Defaults
OK
Cancel
Apply

Bits per second: 19200

Data bits: 8

Parity: None

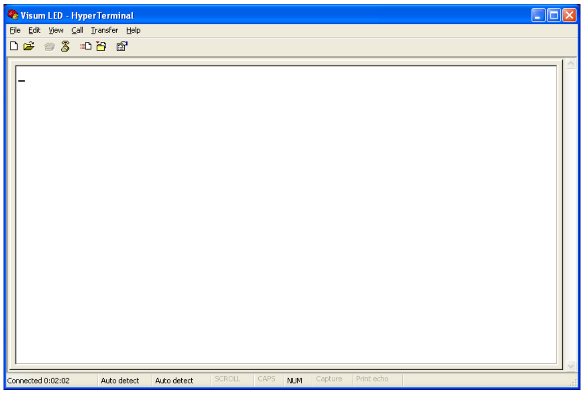
Stop bits: 1

Flow control: None

COM Properties Dialog

6. Select the following options for the listed fields:
   - **Bits per second:** 19200
   - **Data bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None
7. Click **OK.**

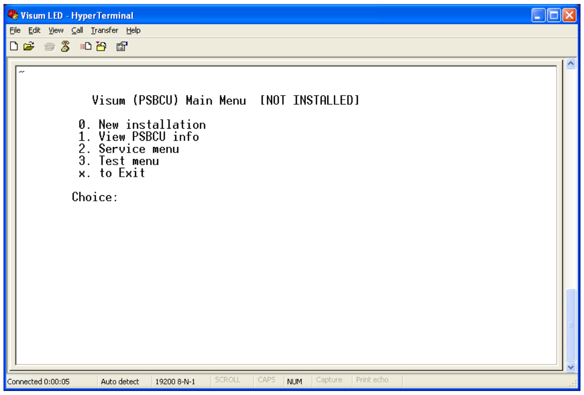
   The Visum LED - HyperTerminal Screen should display.


Visum LED - HyperTerminal
File Edit View Call Transfer Help
Connected 0:02:02
Auto detect
Auto detect
SCROLL
CAPS
NUM
Capture
Print echo

Visum LED - HyperTerminal Screen

This screen indicates that a connection has been established between your laptop and the Visum LED system.

9.4.4 Visum LED Main Menu


Visum LED - HyperTerminal
File Edit View Call Transfer Help
Connected 0:00:05
Auto detect
19200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
~


      Visum (PSBCU) Main Menu  [NOT INSTALLED]

    0. New installation
    1. View PSBCU info
    2. Service menu
    3. Test menu
    x. to Exit

   Choice:
```

Visum LED Main Menu

To view the Main Menu, press "~" on the laptop keyboard. The Visum LED Main Menu should display.

The following information can be accessed from the main menu:

- New Installation
- Service Menu
- View power supply boxCU info
- Test Menu

Note Notice that [NOT INSTALLED] displays after the menu name in the figure above to indicate the LED Light System has not been installed.

9.4.5 New Installation

To set up a new installation press "0" on your keyboard. The system will prompt you to provide the following information:

- Region Number
- Account Number
- Location of the Installation (room number or operating room number)
- Light Indication: L1 and L2 or L3 and L4.
- Finished Installation, Are you sure 'y' or 'n' (program is case sensitive)

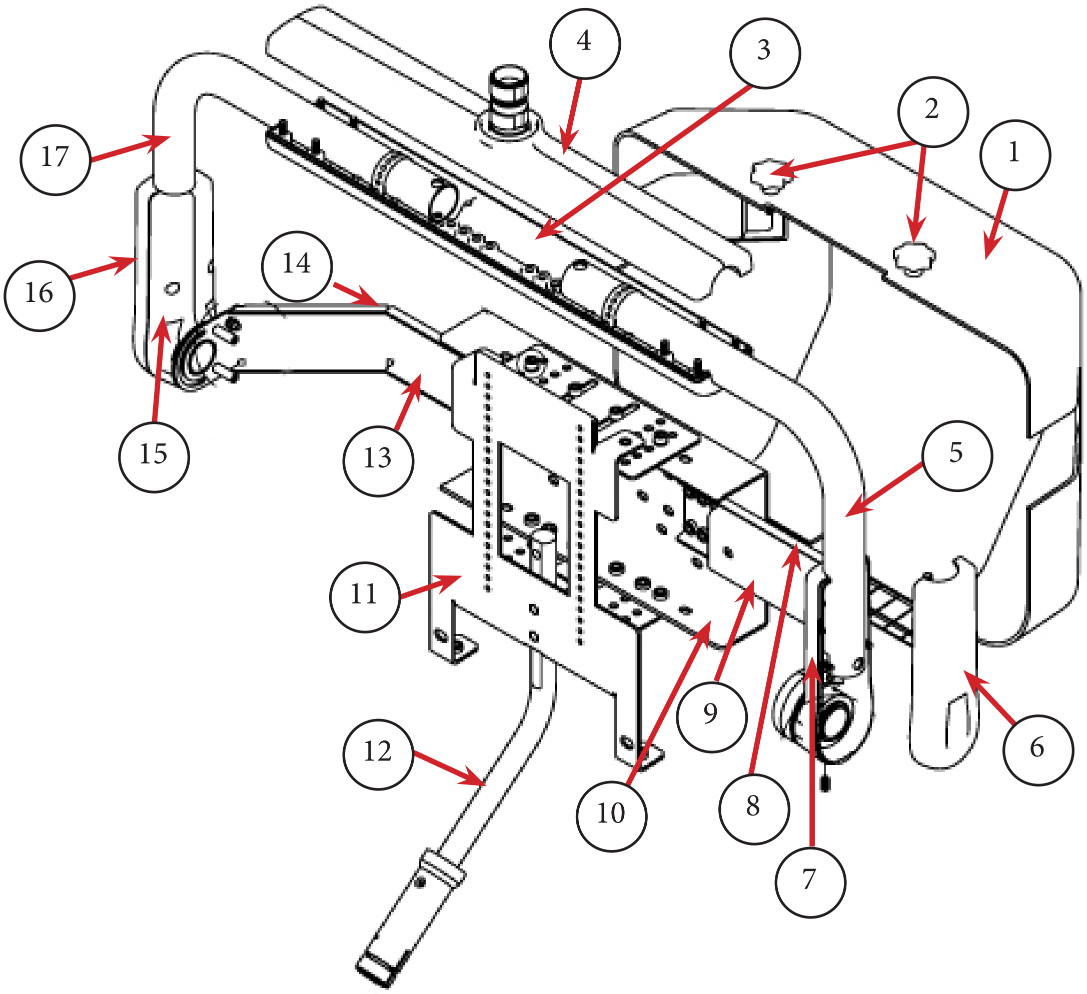
Note Obtain the Region Number and Account Number from your Project Manager if this information is unknown to you.

The system completes the installation after your response to the last inquiry. Enter <x> to exit the installation.

The installation is successful if the LED lights on the Wall Control Unit are not flashing.

10. Monitor Assembly

10.1 Light Flat Panel or Single Panel installation



Yoke Anatomy

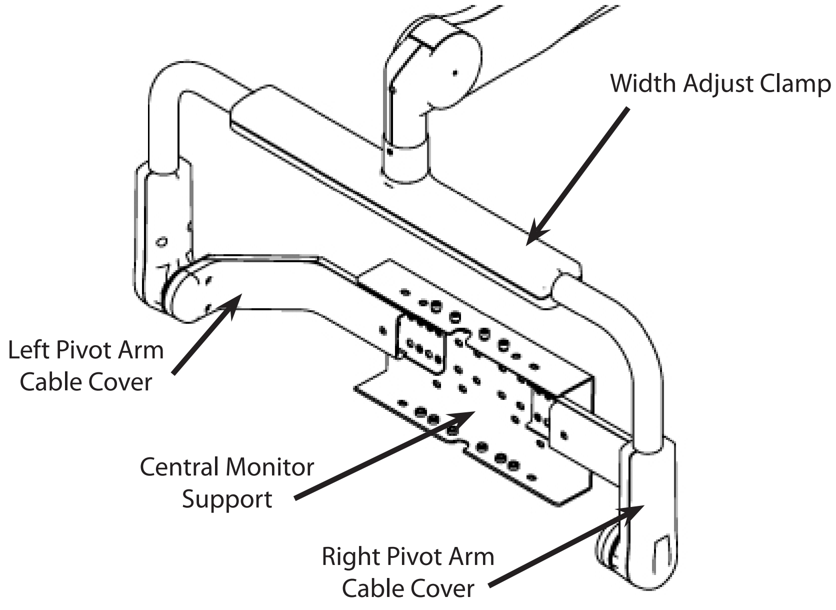
Part	Description	Part	Description
1	Shroud	10	Central Monitor Support Bracket
2	Shroud Knobs	10.	Monitor Vertical Adjust Bracket
3	Monitor Width Adjust Clamp Bottom	12	Handle Assembly
4	Monitor Width Adjust Clamp Top	13	Left Pivot Arm Cable Cover
5	Right Side Support Tube	14	Left Pivot Arm
6	Outer Right Adjust Clamp	15	Inner Left Adjust Clamp
7	Inner Right Adjust Clamp	16	Outer Left Adjust Clamp
8	Right Pivot Arm	17	Left Side Support Tube
9	Right Pivot Arm Cover		

10.2 Adjusting the Yoke

10.2.1 Adjusting the Width

To adjust the width of the yoke:

1. Remove the power supply from the Central Monitor Support Bracket.
2. Remove the cable cover that is concealing the cables on the left Pivot Arm.

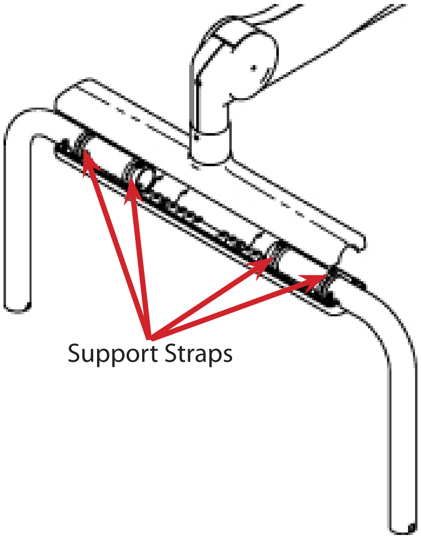

Width Adjust Clamp
Left Pivot Arm Cable Cover
Central Monitor Support
Right Pivot Arm Cable Cover

Remove the cable cover

Note It is not necessary to remove the cable cover from both Pivot Arms, only the left side where the cables are concealed.

3. Remove the Central Support Bracket by removing the eight M6 socket head screws and all washers using a 5mm Allen wrench.

Caution **Before beginning to remove the screws holding the Width Adjust Clamp together, loosely place two cable ties around each side of the clamp to prevent the yoke from falling once the screws have been removed.**



Support strap locations
(each yoke will only contain two support straps even though four are shown in this figure)

4. Remove the eight M5 screws located under the Width Adjust Clamp using a 4mm Allen wrench, and pull down the clamp.
5. Loosen the support strap inside the Width Adjust Clamp that is securing the support tube in place from either the left or the right side. Do not remove the strap completely.

Note For ease of installation, adjust one side at a time.

6. Yoke width is adjusted by inserting the tube alignment pins into the numbered holes in the bottom piece of the Width Adjust Clamp. Use Table 10.1 to determine the correct holes for the monitor, and seat the alignment pins in their respective bracket holes.

Note Measurements presented in the table are estimates only. Adjustments may need to be made before completing installation to ensure correct balance and fit.

7. Secure the horizontal tube to the lower Width Adjust Clamp by tightening the support straps with self tapping screws until the strap is torqued. Avoid tearing the strap.

WARNING **Failure to tighten the support straps could result in the yoke falling.**

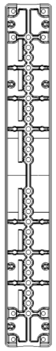
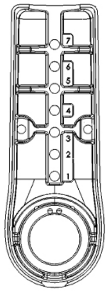
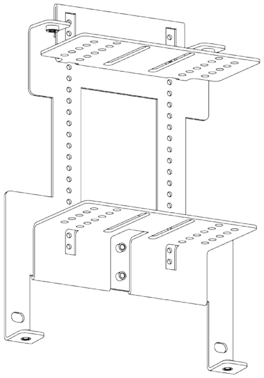
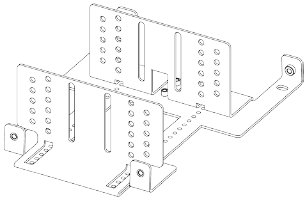
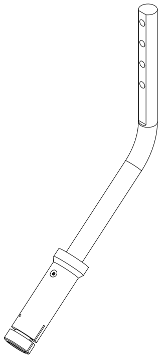
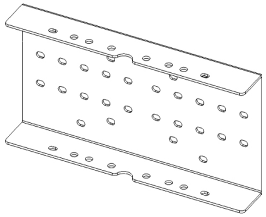
Note Use the inside strap locations when possible.

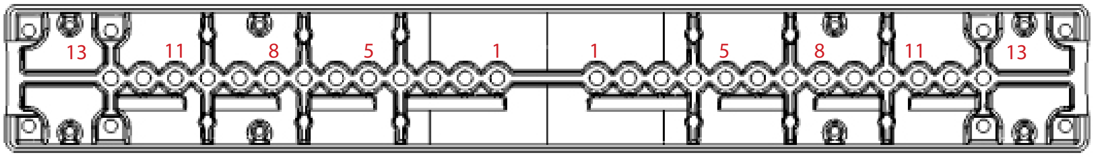
8. Repeat steps 5-7 for the opposite side.
9. Reassemble the Width Adjust Clamp and secure using the M5 socket head screws. Tighten all screws to 35 lb. in. (3.95 Nm) torque.

WARNING **Ensure that all screws are present. Missing screws could result in the yoke falling.**

Note Use a torque wrench to tighten screws. If a torque wrench is not available, do not attempt to tighten screws yourself, but contact your Stryker representative.

Table 10.1 - Bracket Adjustments

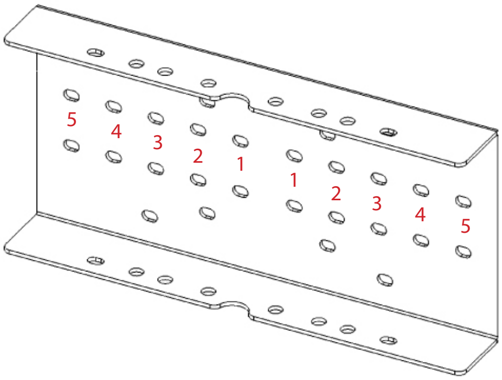
Monitor	**Width Pin**	**Height Pin Placement**	**Vertical Monitor Adjustment Hole**	**Depth Monitor Adjustment Hole**	**Handle Adjust Hole**	**Central Monitor Support**
Stryker Vision Elect HDTV 26”	5	3	Bottom screws in 8	4	Bottom 2 holes	3 and 4
Stryker Vision Elect 21”	1	3	Bottom screws in 10	1	Bottom 2 holes	1 and 2
Radiance 19”	1	3	Bottom screws in 5	3	Bottom 2 holes	1 and 2
Sony LMD 24”	5	3	Bottom screws in 10	3	Bottom 2 holes	3 and 4
Most Expanded Configuration Allowable	7	7	Bottom screws in 5	1	Top 2 holes	4 and 5
Most Collapsed Configuration Allowable	1	1	Top screws in 5	11	Bottom 2 holes	1 and 2
						



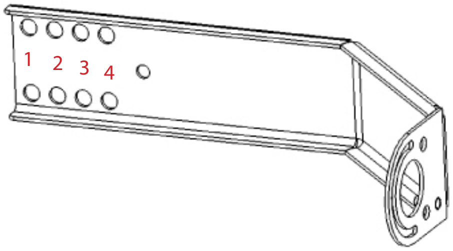
Width Adjust Clamp

10. Using Table 10.1 as a guide, reattach the Central Monitor Support to the Pivot Arms using all eight socket head screws and related washers, ensuring that each Pivot Arm has a least one serrated washer attached for grounding purposes. Be sure to center the Central Support Bracket within the general assembly. Tighten all screws to 65 lb. in. (7.34 Nm) torque.

⚠ **WARNING** **It is necessary to use serrated washers and scratch them through the paint layer to the actual metal surface to prevent the possibility of electric shock.**



Central Monitor Support Bracket

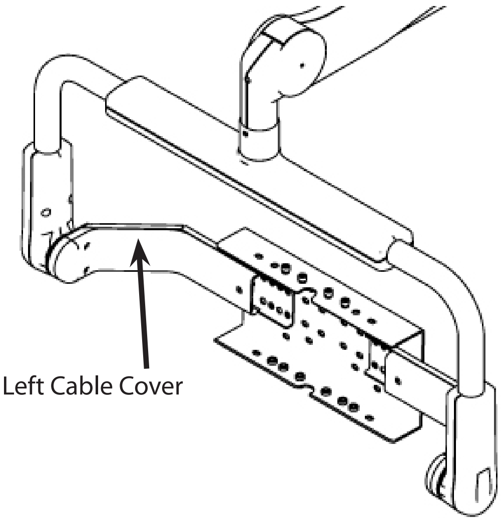


Pivot Arm

⚠ **Warning** **Ensure that all screws are present. Missing screws could result in the yoke falling.**

☞ **Note** Use Table 10.1 as a guide on how to properly adjust the yoke to account for the center of gravity. If the center of gravity is improperly balanced, the yoke will not perform correctly.

10.2.2 Adjusting the Height



Left cable cover

1. Remove the cable cover from the left Pivot Arm where the cables are concealed.

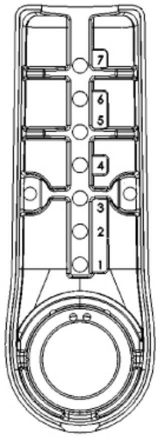
> **Note** It is not necessary to remove the cable cover from both horizontal arm supports, only the left side where the cables are concealed.

2. Remove the M5 screws from either the left or right Height Adjust Clamp. Use care when removing the screws, as pieces of the clamp may fall off.

> **Note** For ease of installation, adjust the height one arm at a time.

3. Remove the outer piece of the Height Adjust Clamp and remove the tube alignment pin from the inner piece.
4. Use Table 10.1 to determine the appropriate hole to seat the alignment pin into in the inner piece of the Height Adjust Clamp.

> **Note** Measurements presented in the table are estimates only. Adjustments may need to be made before completing installation to ensure correct balance and fit.



Height Adjust Clamp

5. Set the alignment pins in their respective bracket holes in the inner Height Adjust Clamp.
6. Reattach the outer Height Adjust Clamp and secure with M5 socket head screws. Tighten all screws to 35 lb. in. (3.95 Nm) torque.

> **WARNING** **Ensure that all screws are present. Missing screws could result in the yoke falling.**

7. Repeat steps 1-5 for the opposite Height Adjust Clamp.
8. Attach the cable cover to the Left Pivot Arm, using three M4 X 12 button head socket cap screws. Hand tighten all screws fully.

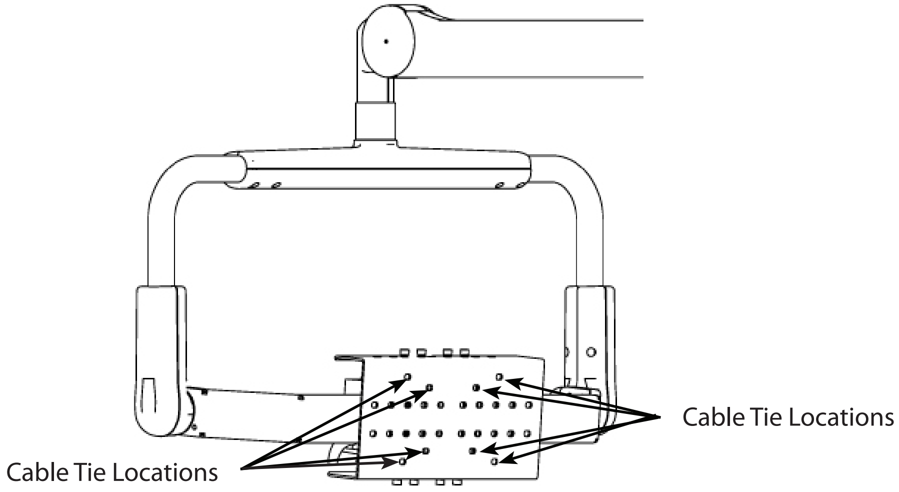
> **Note** Ensure that cables do not get pinched.

10.3 Attaching the Monitor

1. Attach the power supply to the Central Support Bracket using cable ties. Tighten the cable ties to prevent movement of the power supply.
2. Ensure that all monitor cables lay flat below the power supply and are routed to the right or left.

Caution **Take care not to kink the fiber optic cable beyond a 5mm bend radius to prevent damaging it.**

WARNING **DO NOT OVERLOAD THE ADJUSTABLE YOKE.**



Cable tie locations

3. Lay the monitor screen side down on a flat surface.

Caution **If there are knobs that extrude from the surface of the monitor, take care to ensure that they hang off the edge of the table to prevent them from being broken or damaged while installing the Monitor Vertical Adjust Bracket.**

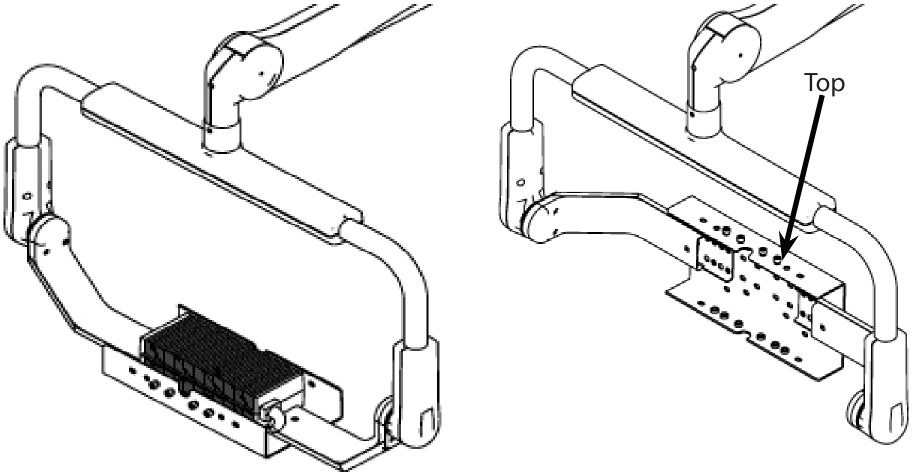
Caution **Take care not to scratch the monitor screen when placing it face down.**

4. Align the holes on the Monitor Vertical Adjust Bracket with the VESA mounting holes on the back of the monitor, using Table 10.1 as a guide. Ensure that the cutout for the handle assembly is at the bottom of the monitor.
5. Secure the Monitor Vertical Adjust Bracket to the back of the monitor using four M4 socket head screws, and tighten using a 3mm Allen wrench.

WARNING **Ensure that all screws are present. Missing screws could result in the monitor falling.**

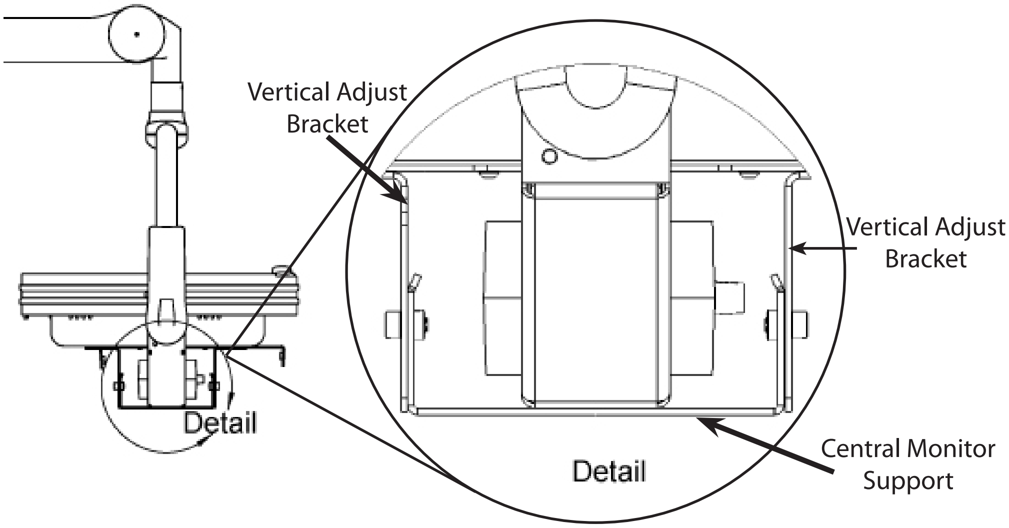
6. Align and place the handle assembly on the back of the Monitor Vertical Adjust Bracket using the screw mounting holes. Take care to ensure that the handle assembly does not interfere with the base of the monitor.
7. Secure the handle assembly to the Monitor Vertical Adjust Bracket using two M5 socket head screws and washers; tighten to 35 lb. in. (3.95 Nm) torque.

8. From the position shown in the next figure, rotate the Pivot Arms of the support bracket to determine which side is the top to ensure that the monitor is installed right side up. The pivot arm will rotate 90° in one direction only; the side that rotates up is the top.



Bracket rotations

9. Place the monitor onto the Central Monitor Support Bracket so that the Monitor Vertical Adjust bracket is seated outside the Central Monitor Support Bracket.



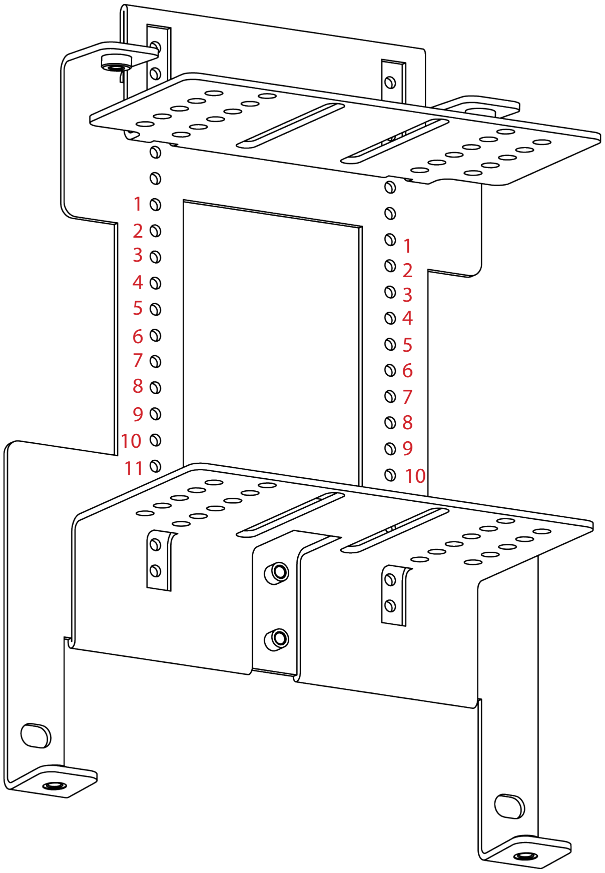
Monitor Vertical Adjust Bracket seated outside the Central Monitor Support Bracket

10. Align the safety guide slots on the Monitor Vertical Adjust Bracket with the center-most two holes on the Central Monitor Support Bracket. Secure the brackets together using four M6 socket head screws, and loosely tighten using a 5mm Allen wrench. Do not tighten screws completely to allow the monitor to slide freely in the safety guides.
11. Tip the monitor up into a vertical position.
12. Slide the monitor backward or forward so that the end of the Monitor Vertical Adjust Bracket sits flush with the back of the Central Support Bracket, or to provide enough space for the power supply. Be sure that the handle does not touch the power supply.
13. Align the bracket adjustment holes on both brackets, and secure them together using four M6 socket head screws and serrated washers. Tighten all screws to 65 lb. in. (7.34 Nm) torque.
14. Connect the cables to the monitor.

15. Attach the shroud to the back of the Adjustable Yoke using the four knob screws.

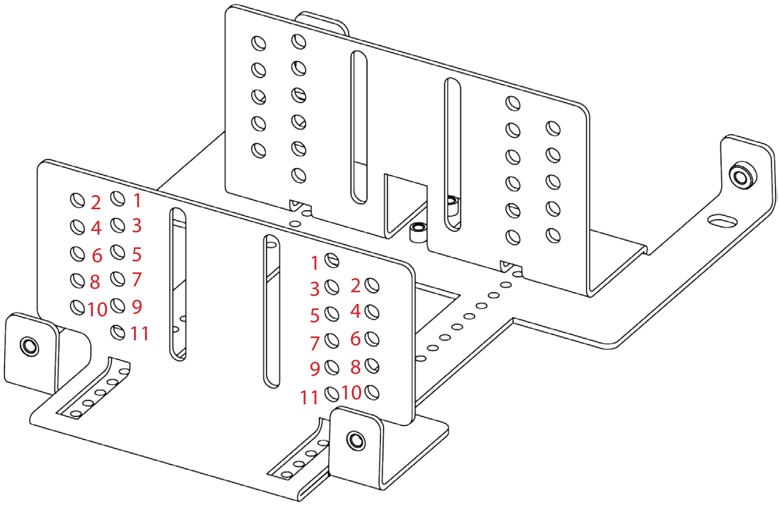
⚠ **WARNING** **Ensure that all screws are present. Missing screws could result in the yoke falling.**

10.4 Balancing the Monitor



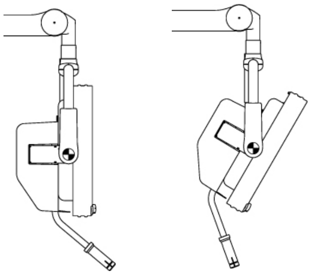
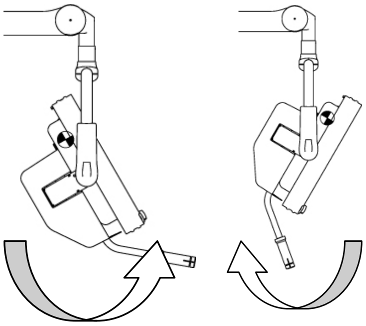
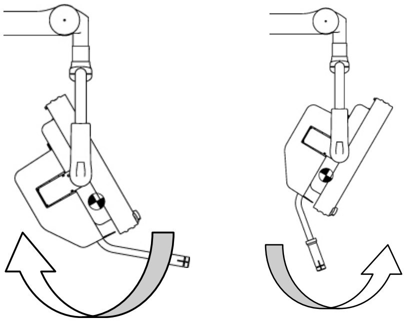
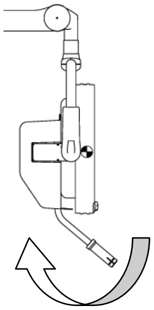
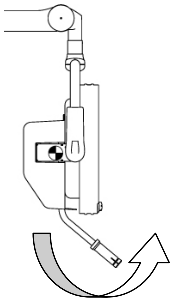
When the monitor is balanced correctly and the brakes are properly adjusted, the yoke will always hold the position in which it is placed throughout its range of motion. Improper balance and brake adjustments may result in the monitor drifting when it is released. The vertical and horizontal adjustments of the yoke center of gravity are accomplished by changing the position of the Monitor Vertical Adjust Bracket either on the back of the monitor, in relation to the Central Monitor support bracket, or both.

To test balancing and brake adjustment, move and release the yoke in various positions throughout it's range of motion. If the monitor drifts in any position, use Table 10.2 to determine where the center of gravity is located; use Table 10.1 as an adjustment guide. Note that the yoke's center of gravity may require adjustment in both the vertical and horizontal directions (for example top-heavy or bottom-heavy). If the monitor still continues to drift, tighten the brakes.



Monitor Vertical Adjust Bracket (see Table 10.1)

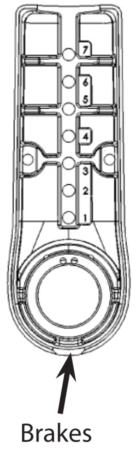
Table 10.2 - Adjusting the Center of Gravity

Monitor Center of Gravity and Drift Direction	Condition
	The center of gravity is aligned with the pitch adjustment joint, and the yoke is **balanced**. The monitor does not drift when released from any position with little brake force.
	**Problem:** Monitor is top-heavy **Solution:** Move monitor down on Vertical Adjust Bracket
	**Problem:** Monitor is bottom-heavy **Solution:** Move monitor up on Vertical Adjust Bracket
	**Problem:** Monitor is front-heavy **Solution:** Move monitor and Vertical Adjust Bracket backward on Central Monitor Support
	**Problem:** Monitor is back-heavy **Solution:** Move monitor and Vertical Adjust Bracket forward on Central Monitor Support

If the monitor does not continue to fall forward or backward on its own, it is properly adjusted.

10.5 Adjusting the Brakes

Once the center of gravity has been properly adjusted, you may need to tighten or loosen the tension on the brakes.



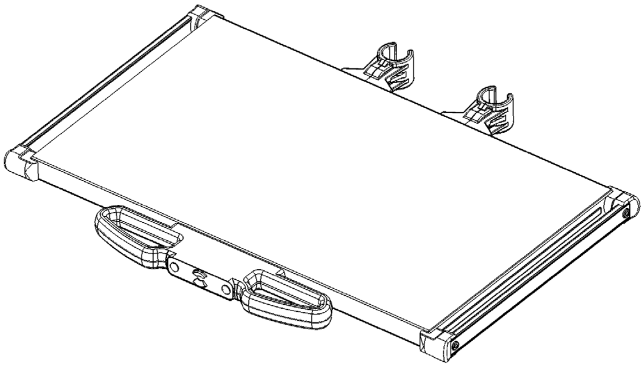
Brake location

To adjust the brake tension, insert a 3mm Allen wrench into the socket head screw located on the underside of the respective height adjust arm and tighten the screw in a clockwise direction or loosen in a counterclockwise direction. Only tighten or loosen the screw slightly to determine if it is sufficient to hold the monitor in place. Adjust brake screws identically for both sides at the same time (i.e., turn the right side one quarter turn, then turn the left side one quarter turn). Continue to adjust the brakes a little bit at a time until they easily hold the monitor in place throughout it’s range of motion.

11. Boom Shelf Attachment and Adjusting Brakes/Stops

11.1 Boom Shelf and Accessories Attachment

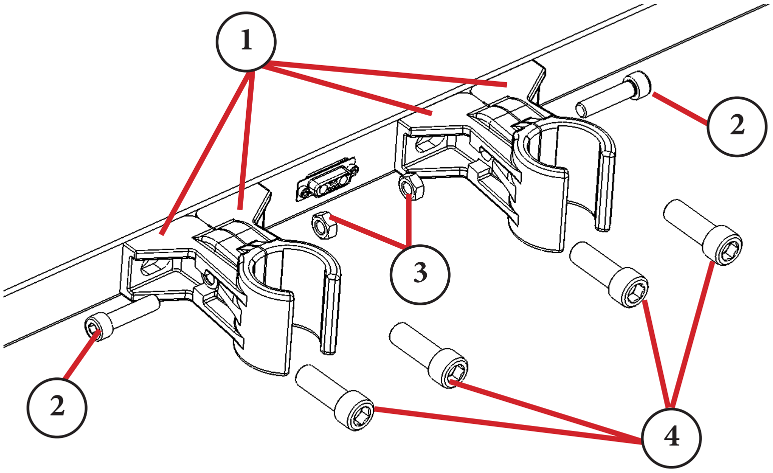
11.1.1 FLEXiS Shelf Installation



Shelf with handle attached

To install a shelf:

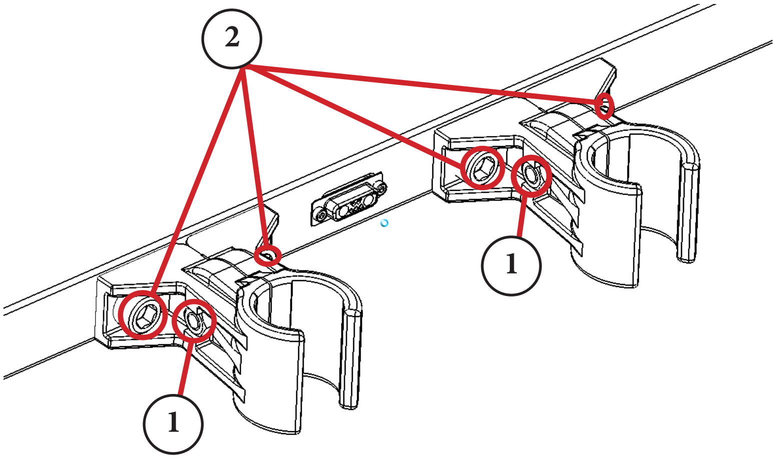
1. Remove the shelf from the packaging. The shelf should include all the parts shown in the figure above, unless it comes without a handle.
2. Assemble the shelf clamps.
   a. Combine the clamp pieces as shown in the figure below (Item 1). Use the M8 clamp screw (Item 2) and clamp nut (Item 3) to loosely assemble the clamps.
   b. Assemble the M10 mounting screws (Item 4) through the clamps into the shelf.



Shelf Assembly

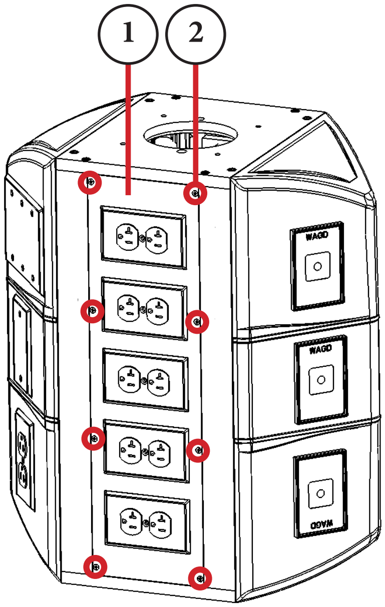
Part	Part Name
1	Shelf Clamps
2	M6 Clamp Screws
3	Clamp Nuts
4	M10 Mounting Screws

3. Loosen the mounting screws (Item 2).
4. Loosen the clamp screws (Item 1 in the following figure) as much as possible without disassembly.



Screw and Nut Locations

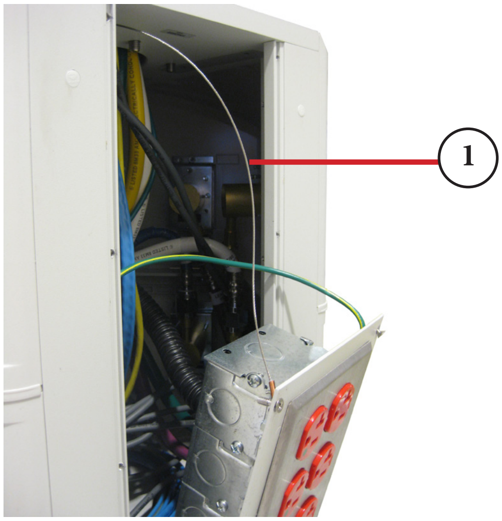
5. Slide each clamp assembly apart and position the shelf on the MFRs of the FLEXiS System. The clamps should be able to open enough to directly install the shelf to the desired location. The shelf can also be attached by sliding the clamps onto the MFRs.
6. If the clamps cannot close properly, the shelf may not be level.
7. Fully tighten the clamp screws (Item 1).
8. Fully tighten the mounting screws (Item 2).



Location of Screws on Access Panel

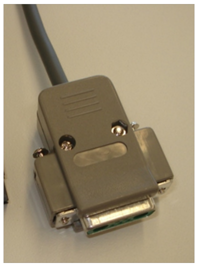
9. If the shelf has a handle, connect the control cable from the FLEXiS System to the connector on the back of the shelf.
   a. Using a Phillips screw driver, open the access panel (Item 1) on the front or back of the FLEXiS System by removing the eight Phillips screws (Item 2).

b. The access panel is attached to the FLEXiS System via a tether wire inside the system to prevent it from falling when removed. Ensure the panel rests on the tether when it is removed and not on the medical gas hoses.



Tether Wire Location

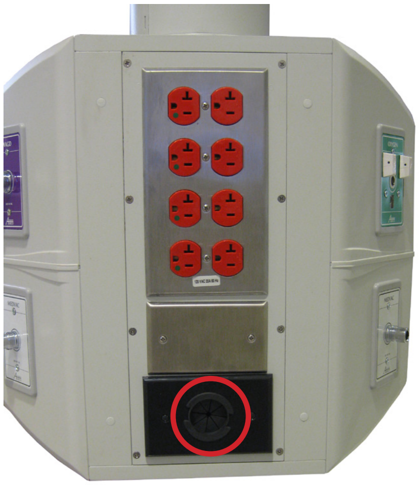
c. Locate the control cable connector inside the FLEXiS System.



Control Cable for a Shelf with Handle

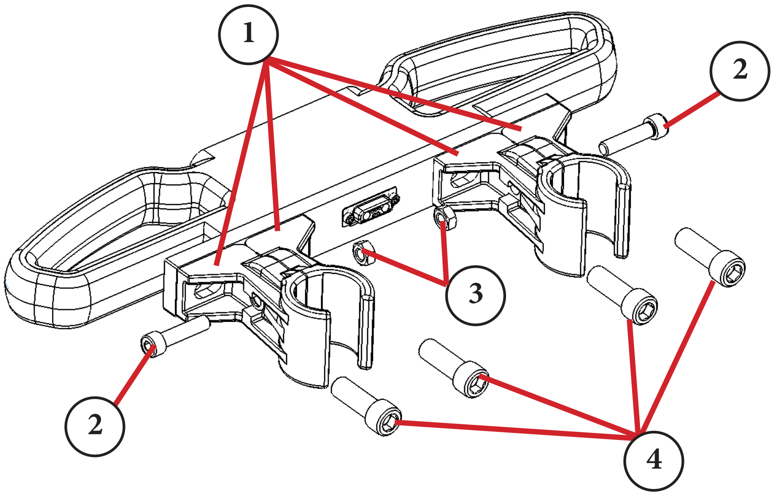
d. Pass the control cable through the data pass-through on the same side as the shelf with handle.

e. Connect the control cable to the shelf and store cable slack inside the FLEXiS System.



Data Pass-Through Location

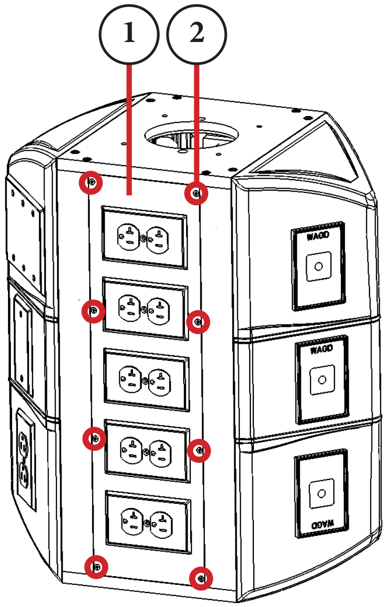
11.1.2 FLEXiS Handle to MFR Bracket Installation



Handle Assembly

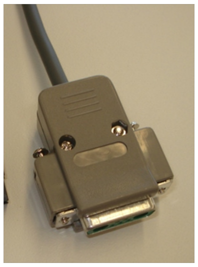
Part	Part Name
1	Clamps
2	M6 Clamp Screws
3	Clamp Nuts
4	M10 Mounting Screws

1. Remove the handle to MFR bracket and handle from the packaging. The handle with bracket should include all the parts seen in the figure above. The clamps may be disassembled.
2. If the bracket comes with clamps attached skip to Step 5, otherwise assemble the clamps.
   a. Combine the clamp pieces as shown in the figure above (Item 1). Use the M8 clamp screws (Item 2) and clamp nut (Item 3) to loosely combine the clamps.
   b. Assemble the M10 mounting screws (Item 4) through the clamps into the handle. Do not tighten completely
3. Loosen the mounting screws (Item 4).
4. Loosen the clamp screws (Item 2) as much as possible without disassembly.
5. Slide each clamp assembly apart and position the bracket on the MFRs of the FLEXiS System. The clamps should be able to open enough to directly install the bracket to the desired location.
6. Use a level to ensure the shelf is level.
7. Fully tighten the clamp screws (Item 2).
8. Fully tighten the mounting screws (Item 4).

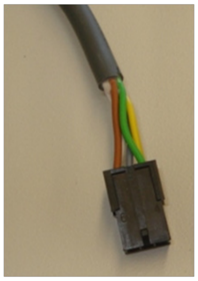


Location of Screws on Access Panel

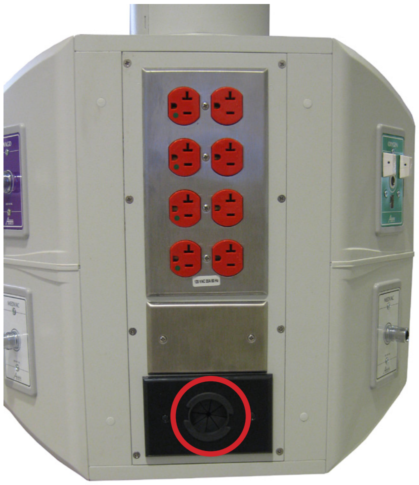
9. Connect the control cable from the FLEXiS System to the connector on the bracket.
   a. Using a Phillips screw driver, open the access panel (Item 1) on the front or back of the FLEXiS System by removing the eight Phillips screws (Item 2).
   b. Locate the control cable connector inside the FLEXiS System. If this handle is the main control interface of the boom use the primary (larger) connector. If this handle is an addition to a shelf control use the extra cord provided with the handle and connect to the secondary (smaller) control cable inside the FLEXiS System.



Primary Control Cable



Secondary Control Cable

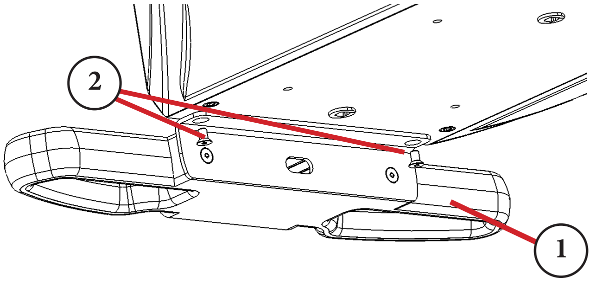


Data Pass-Through Location

c. Pass the control cable through the data pass-through on the same side as the handle.
d. Connect the control cable to the bracket and store cable slack inside the FLEXiS System.

11.1.3 FLEXiS Handle to Service Head Installation

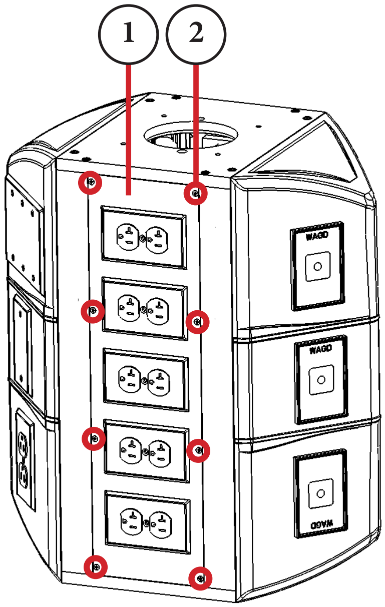
1. Remove the handle to chassis bracket from the packaging.
2. Position the handle and bracket under the FLEXiS System (Item 1) chassis in the desired location.
3. Install the M3 mounting screws (Item 2) into the bottom plate of the FLEXiS System.



Handle to FLEXiS Bracket

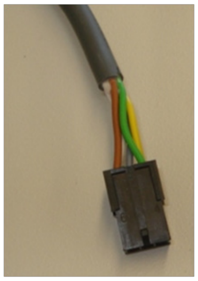
1	Handle and Bracket
2	M3 Mounting Screws

4. Connect the control cable from inside FLEXiS System to the additional cable included with the bracket.
    a. Using a Phillips screw driver, open the access panel (Item 1) on the front or back of the FLEXiS System by removing the eight Phillips screws (Item 2).



Location of Screws on Access Panel

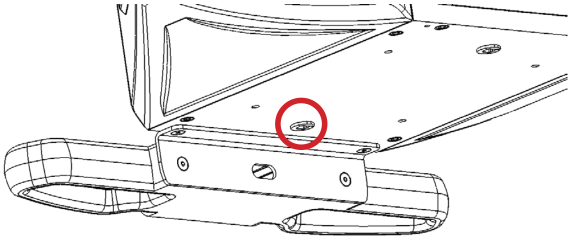
    b. Locate the control cable connector inside the FLEXiS System.



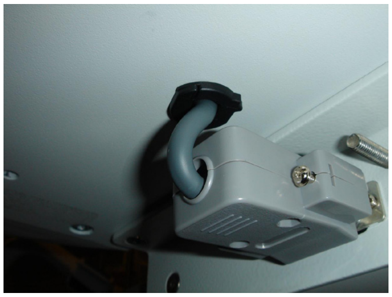
Secondary Control Cable

    c. Remove the strain relief plug from the bottom of the FLEXiS System by punching it out from the inside of the FLEXiS using a screw driver or similar tool.

⚠ **Caution** **Take care not to damage the service head when removing the strain relief plug.**



Strain Relief Plug Location

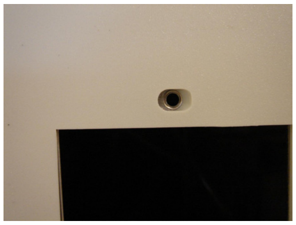


Strain Relief Plug

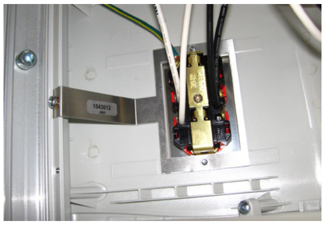
d. Pass the small end of the cable provided with the handle through the strain relief and into the FLEXiS System.
e. Connect the cable to the secondary control cable inside the FLEXiS System.
f. Connect the cable to the D-sub connector on the bracket.
g. Measure the appropriate amount of slack and install the strain relief plug around the cable and into the bottom of the FLEXiS System.

11.1.4 Installing Auxiliary Plates

1. Locate a blank plate location to install the auxiliary plate.

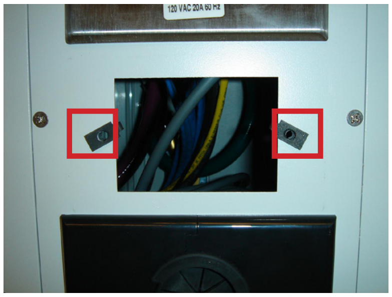


External View



Internal View

2. Remove the two (2) 6-32 screws that hold the plate attached to the service head. These screws are held in place by either a grounding bracket with pem nut (side modules) or metal screw clips (front or back plate), so there are no screw nuts to account for.
3. Route the appropriate cables through the opening and connect to the auxiliary plate.
4. Push any slack from the cable back into the plate opening and install the auxiliary plate with the two (2) 6-32 screws that were removed in Step 2.



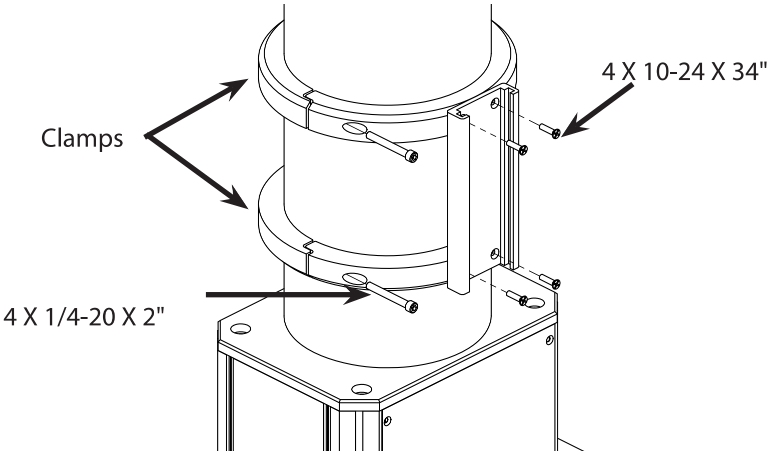
Screw Clips

⚠ **WARNING** **Low voltage plates, medical gas, and video connection plates cannot be installed in the same side module as electrical outlets. Reference the project drawing for specific locations to install data or other low voltage plates. Contact a Field Engineer for any deviations to the project drawing for approval**

11.1.5 Installing Other Accessories

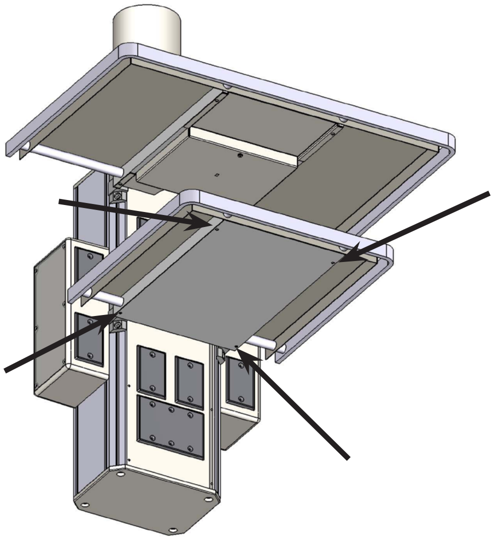
For installation instructions on all other accessories, such as for GCX, IV transfer poles, StrykeVac, etc., please refer the manufacturer's instructions. For instructions on installing a SHAPE Arm, refer to MAP07000.

11.1.6 Installing GCX Accessory Track on OSC600 Down Tube

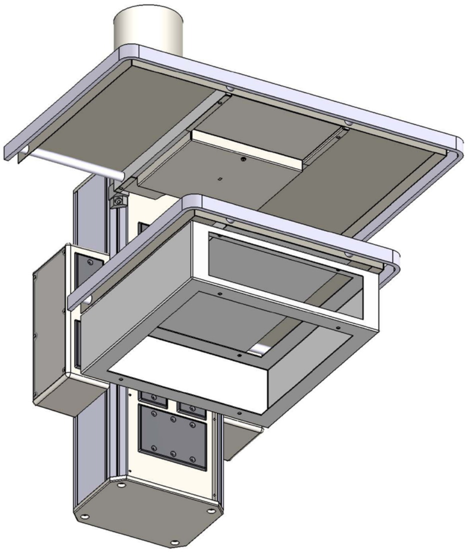


1. Attach track to clamps with four 10-24 X 3/4 FHMS. The clamp beveled edges should be oriented toward the top of the upper clamp and toward the bottom of the lower clamp.
2. Attach assembly to service head down tube with mating clamps and four 1/4-20 X 2 SHCS. Position and orient assembly on tube where desired.

11.1.7 Drawer Installation



1. Pull drawer unit to the edge of the frame, tilt drawer upward, and remove from frame.
2. If the shelf has a bottom plate, remove the four screws from the plate. Use tape to hold the plate in place. Make sure that the brake lines and StrykeVac leads (if applicable) are not pinched between the bottom plate and the shelf frame.



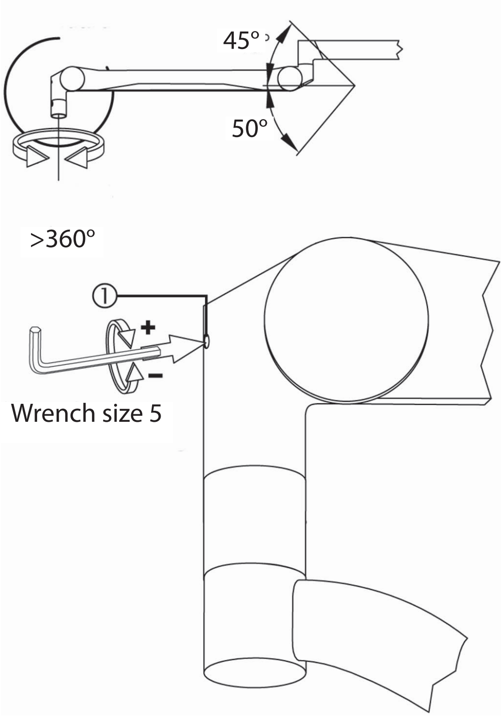
3. Align the four screw holes on the drawer from with the bottom of the plate (if applicable) and shelf frame.
4. Secure the frame using the four M6 X 16 Cheese Head Screws, four lock washers, and four felder washers included with the drawer.
5. Tilt the drawer at an angle, and insert into the frame.

> **Note** For instructions on installing a drawer on a FLEXiS System, refer to the FLEXiS Operations Manual (P13742).

11.2 Lights and Flat Panel Arms

11.2.1 Height Adjustment

11.2.1.1 Standard Spring Arms



Spring Arm Stop Adjustment

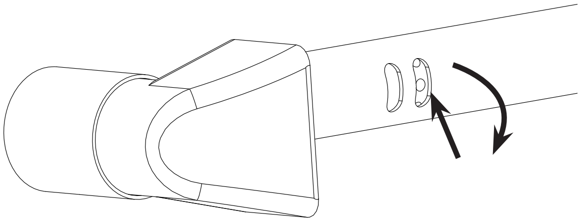
1. Insert the 5mm Hex wrench into the adjustment opening on the Spring Arm.

   The opening is located on the end of the Spring Arm near the light head.
2. Turn the adjustment screw clockwise, then check the maximum height of the light head.

Note The light should not contact any objects near or stationed on the ceiling, including the ceiling.

11.2.1.2 Low Ceiling Spring Arms

1. Remove the covers from the Spring Arm.
   - Remove the Phillips screws on the side of the Spring Arm.
   - Separate the covers while carefully avoiding breaking the plastic clips.
2. Locate the two oval shaped cutouts on the side of the Spring arm.

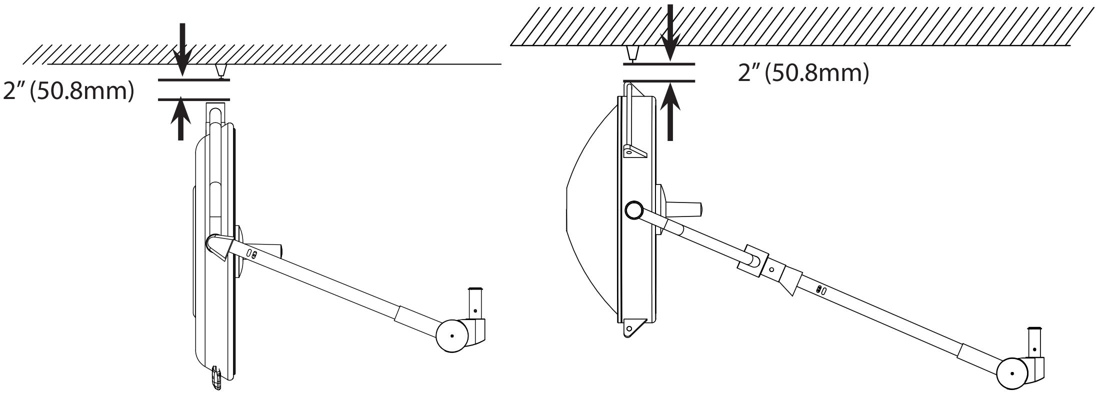


Spring Arm Cutouts

3. Insert a 3mm Allen wrench into the opening shown and pull down to raise the limit of the arm, and pull up to lower the limit.

Note You may have to push the Spring Arm down to see the Vertical Adjust Wheel through the oval shaped cutouts.

4. Turn the light head so that the Cardanic is pointed toward the ceiling. Set the upper limit of the Spring Arm to the point that the Cardanic is 2” (50.8mm) below the lowest structure in the ceiling (e.g., sprinkler head).



Ceiling Clearance

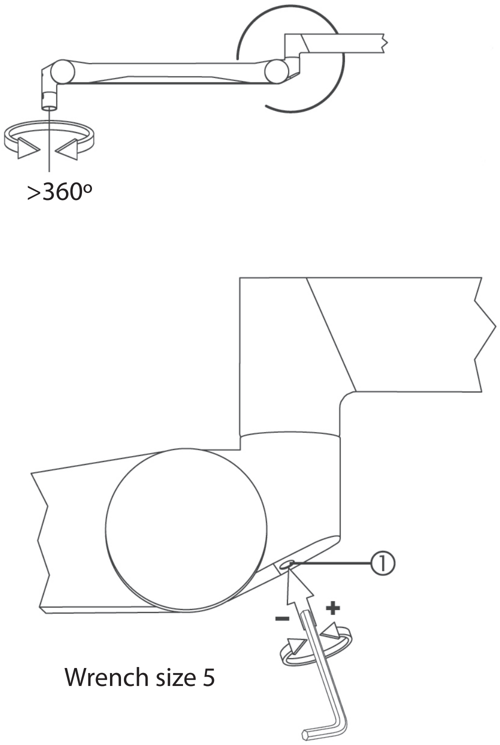
5. Once the limit is set, place the covers back onto the Spring Arm.

11.2.2 Tension Adjustment

> **Note** The Horizontal Arm and Spring Arm should always be parallel to the floor while adjusting the tension.

Push the light head toward the ceiling and release it. If the light head drifts down, insert a 5mm Hex key in the Spring Arm and turn the key counter-clockwise to increase the tension.

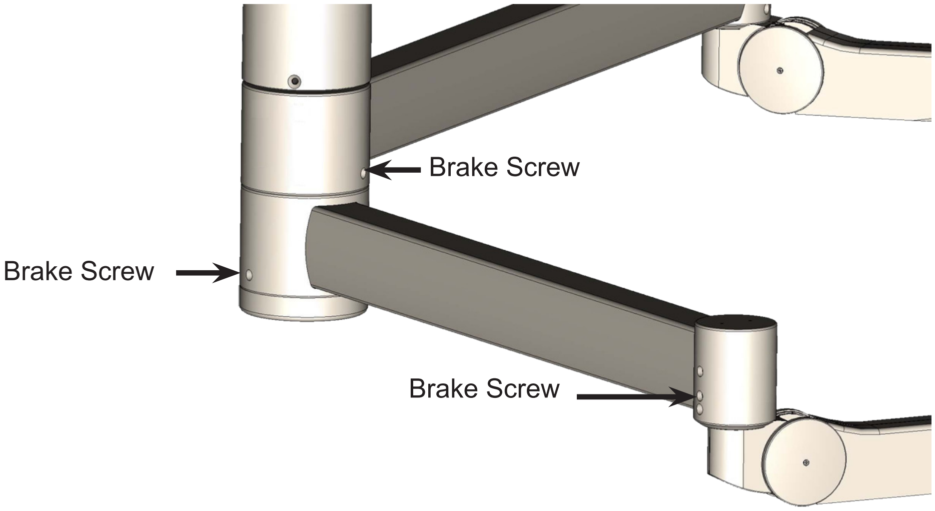
Pull the light head down to the floor and release it. If the light rises, insert a 5mm Hex key in the Spring Arm and turn the key clockwise to decrease the tension.



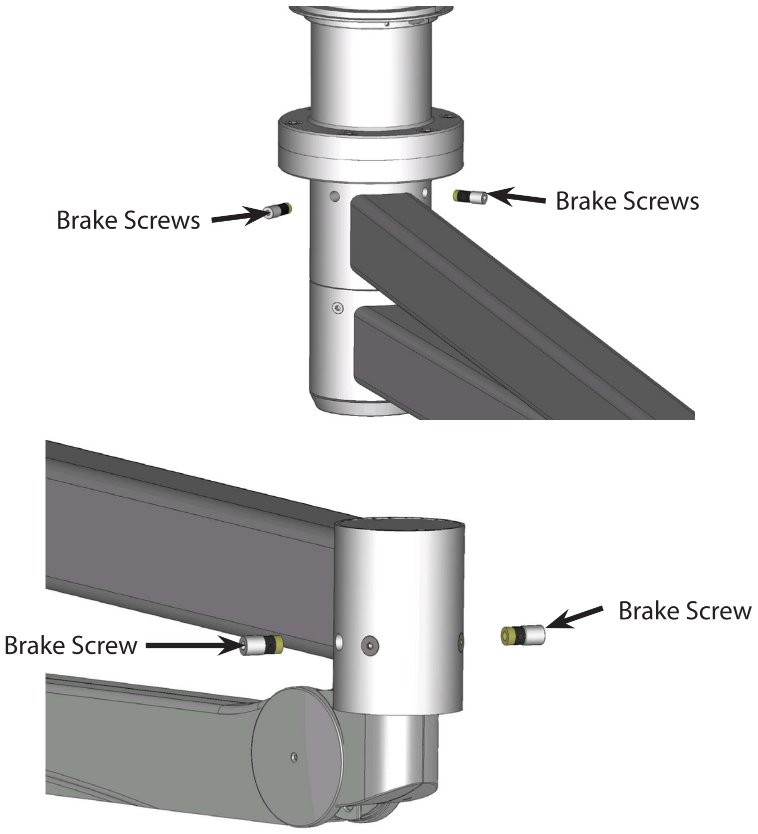
Adjusting Spring Arm

11.2.3 Adjusting the Friction Brakes

Friction brakes hold the suspension in place and prevent drifting. If the brakes are too loose, the suspension may drift during use, but if they are too tight, the suspension may be difficult to move. For each arm, there are two brake screws at the central axis and one at the Spring Arm.



Horizontal Arm Brake Screws
(SHA Only)



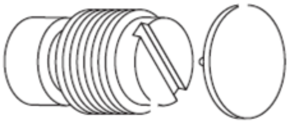
Horizontal Arm Brake Screws
(EHA Only)

Warning **Disregarding the information concerning the adjustment of the brakes could result in injury to the patient or physician.**

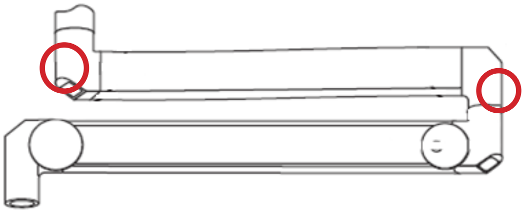
Note If the brakes require excessive tightening or frequent adjustment, refer to the section called, “Adjusting the down tube Screws.”

1. Fill the hollow nose of the brass brake pads with Castrol Optipit grease (PN 0682-300-260) and lubricate the faces of the brake pads with a thin layer of the grease.
2. Thread the brake screws into position using a 4mm hex wrench. Tighten the brake screws until resistance is initially felt; this indicates the brake screws are engaged.
3. Tighten the brake screws:
    - Shoulder Screws: 1 revolution (360°) past the point of resistance
    - Elbow Screws: ¾ of a turn (270°) past the point of resistance
4. Rotate the extension arm to multiple positions throughout its range of motion to check for drifting. If drifting is observed, increase the brake force by turning the brake screws clockwise until the suspension no longer drifts.
5. Finally, tighten the brake screw an additional:
    - Shoulder Screws: 1 revolution (360°) to allow for brake wear
    - Elbow Screws: ¼ of a turn (90°) to allow for brake wear

11.2.4 Adjusting the Brake Force of the Extension and Spring Arms



1. Remove the cover caps.

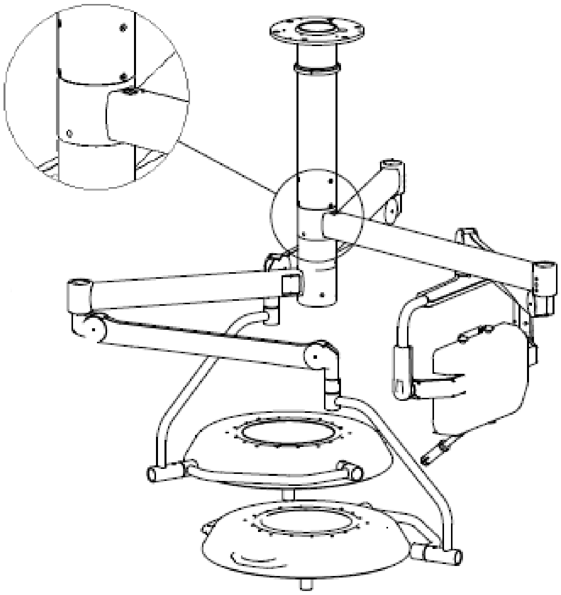


2. To increase the brake force, turn the two slotted brake screws clockwise.
3. Ensure that the extension and Spring Arms can come to rest in any given position withoutt drifting, and that they can be moved easily. If not, slightly turn the screws counterclockwise.

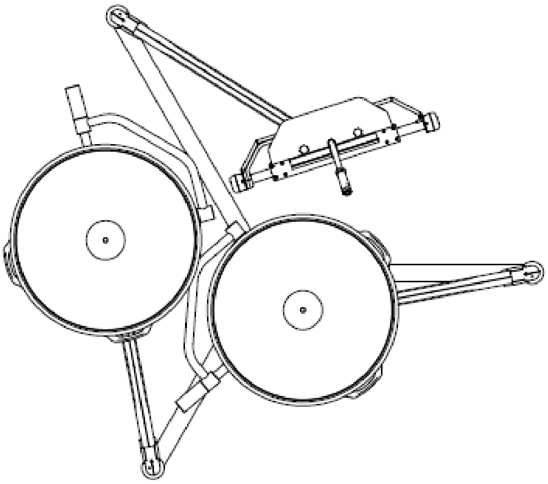
11.2.5 Adjusting Down Tube Screws

If the suspension brakes require excessive tightening or frequent adjustment, it is possible that the suspension is not level. This may be caused by a leaning down tube or loose down tube screws. To check whether the down tube is level, see Section 7. To ensure that the down tube screws are tight, do the following:

1. Rotate the extension arm so that it is below one of the down tube screws (see figure below) and place the remaining arms in a Balance Posture.



Place an extension arm below a vertically-aligned pair of down tube screws.
Place the remaining arms in a Balanced Posture.

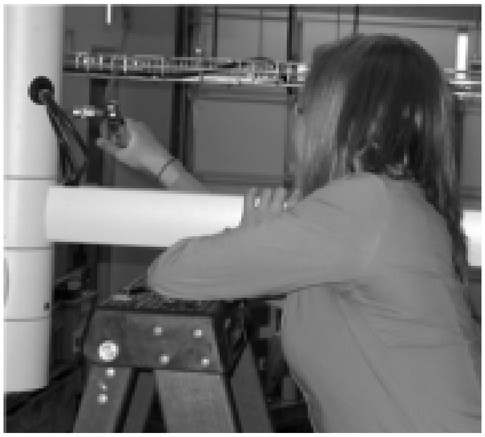


Triple Suspension in Balanced Posture (bottom view):
Extension arms are evenly spaced, and Spring Arms are extended toward the center.
In a dual suspension, the extension arms would be oriented in opposite directions (not shown).

2. While standing on a ladder, place the extension arm on shoulder toward the Spring Arm joint and life suspension up and down (see the figure below). Observe down tube screws for movement. While moving suspension up and down, tighten the two down tube screws that are aligned above the extension arm; tighten down tube screws with a torque wrench set to 100 lb-in (8.33 lb-ft, 11.3 Nm).

Note The specified torque is close to the maximum allowed for the screw. To prevent stripping the screw, ensure the wrench is fully seated in the screw socket when tightening and replace worn screws and wrenches.

WARNING **Keep your back straight and lift the suspension with your legs to prevent injury.**



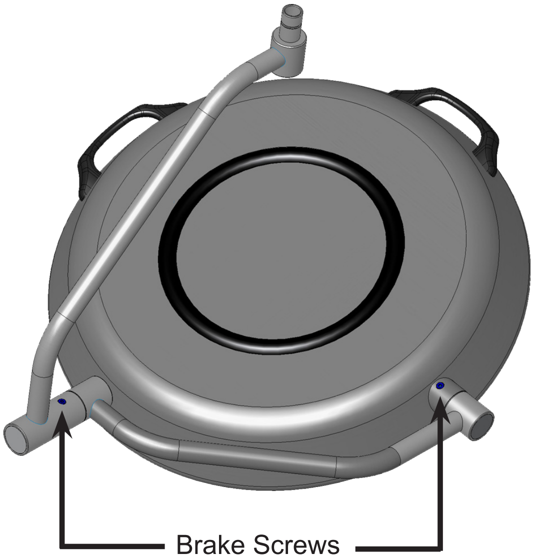
3. Repeat Steps 1 and 2 until all six down tube screws have been tightened.
4. To ensure correct torque is set, **retighten** each screw with a torque wrench set to 100 lb-in (8.33 lb-ft, 11.3 Nm).
5. Ensure that all screws are seated against the down tube and lift suspension up and down. Repeat Steps 1 and 2 if any screws are not seated, or if there is motion (slop) in the suspension.

6. Adjust friction brakes (Section 11.2.1.4) until the suspension no longer drifts.

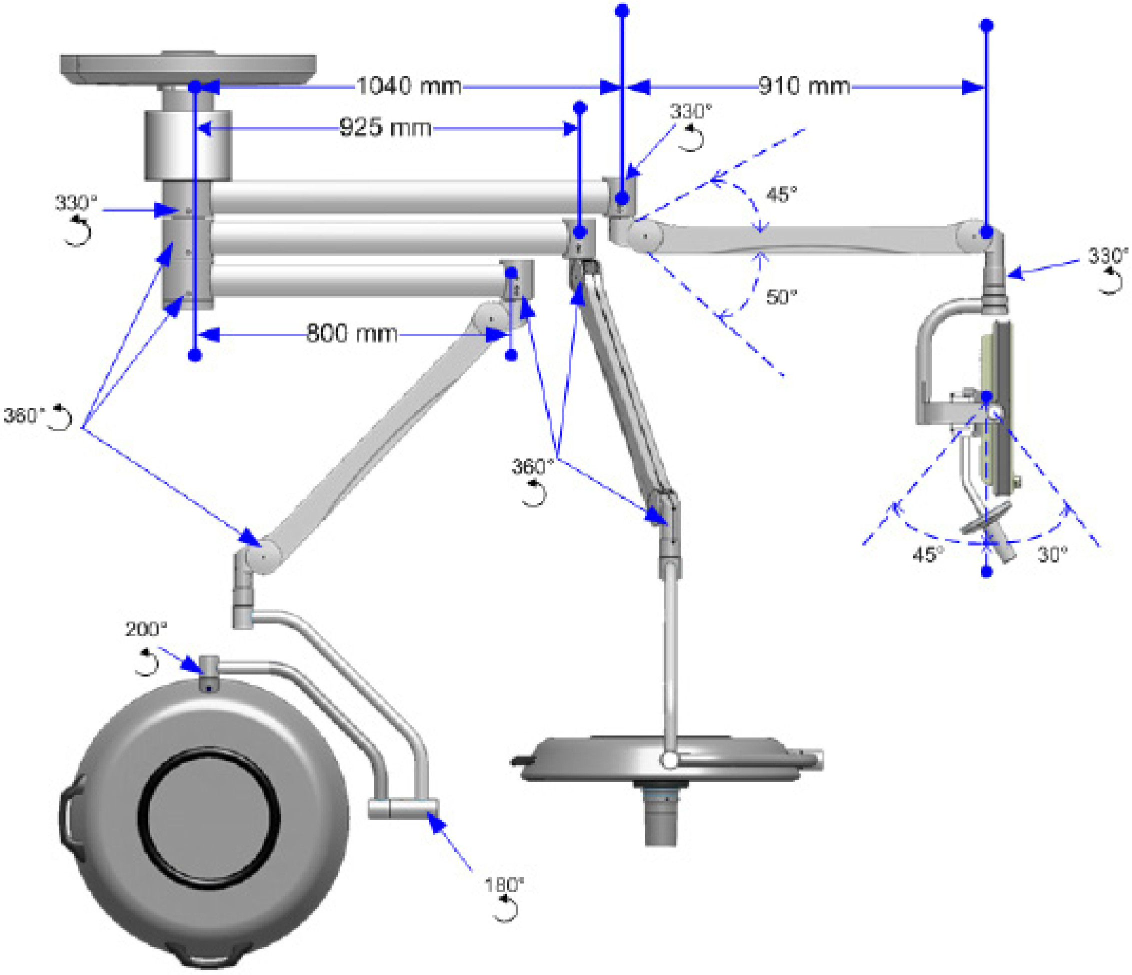
11.3 Adjusting the Cardanic Suspension

Use a 4mm Hex key to adjust the brake screws on the Cardanic suspension. If the brakes are adjusted properly, the light head will not tilt when released and should be easily positioned with the light handle.

- To increase the brake force, turn the screw clockwise.
- To decrease the brake force, turn the screw counterclockwise.



Cardanic Suspension Brake Screws
(The Low Ceiling light only has one brake screw)



Light Suspension Adjustment Points

11.4 Boom Arms

11.4.1 OSC400

11.4.1.1 Mounting Flange

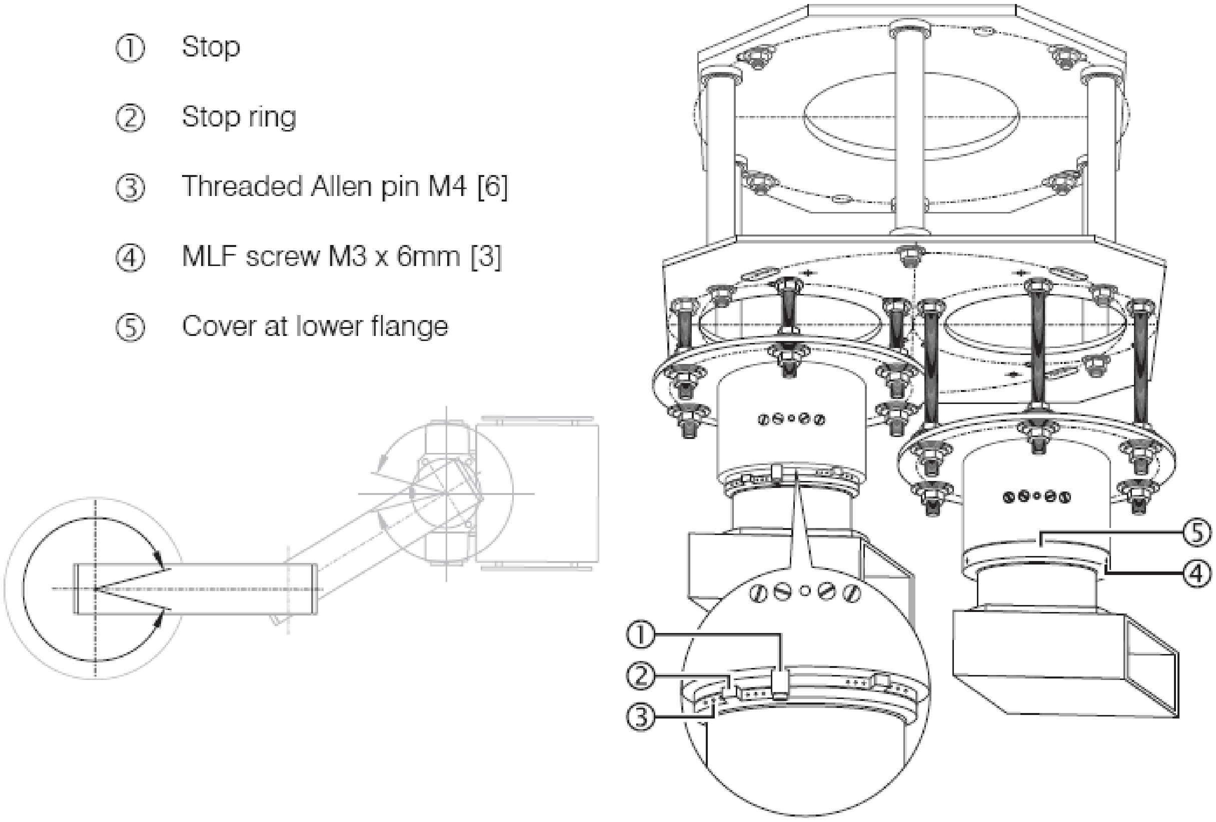
1. Loosen the six set screws (3) in each stop ring (2).
2. Rotate the stop ring (2) to the desired position relative to the fixed stop (1).
3. Tighten the six set screws (3) in each stop ring per stop (2).
4. Ensure that stop rings are in desired position and securely fastened by moving the boom

⚠ **WARNING To prevent the internal supply lines from being twisted off, at least one stop ring (2) must be locked.**

11.4.1.2 Tandem (Long-Flange) Booms

1. To set the stops at the lower flange, the cover (5) must be removed.
2. Remove the three (M3 X 6mm) screws (4) and slide the cover (5) down.
3. Set the stops as described above for the Single (Regular-Flange).
4. Slide the cover (5) up and replace and tighten the three retaining screws (4).

5. Ensure that the cover (5) and the retaining screws (4) are fixed securely.



① Stop

② Stop ring

③ Threaded Allen pin M4 [6]

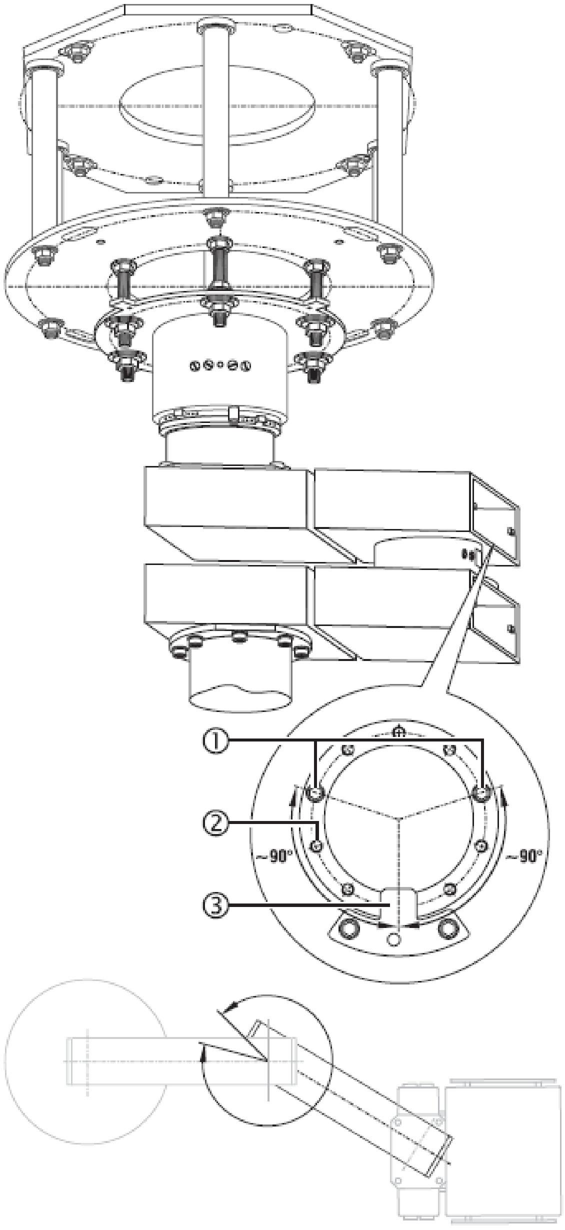
④ MLF screw M3 x 6mm [3]

⑤ Cover at lower flange

Adjusting the Mounting Flange

11.4.1.3 Middle and Service Head Bearings

The middle bearing and service head bearing mechanical stops are adjusted by shifting the locations of socket-head screws (1) located on the bearing, inside the upper arm and inside the down tube, respectively.

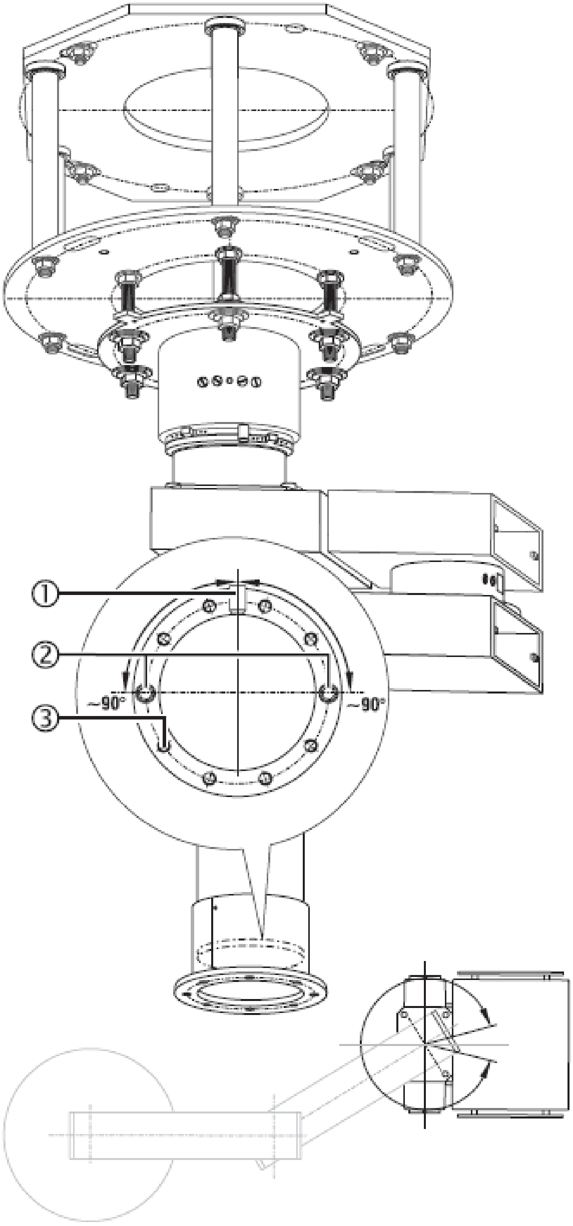


① Stop screw M5 x 15 mm [2]

② Threaded hole [10 x 36° = 360°]

③ Stop

Middle Bearing Adjustment



① Stop

② Stop screw M5 x 15 mm [2]

③ Threaded hole [10 x 36° = 360°]

Service Head Bearing Adjustment

Note The two preinstalled stop screws (1) limit the lower extension arm swiveling range to approximately 180 degrees.

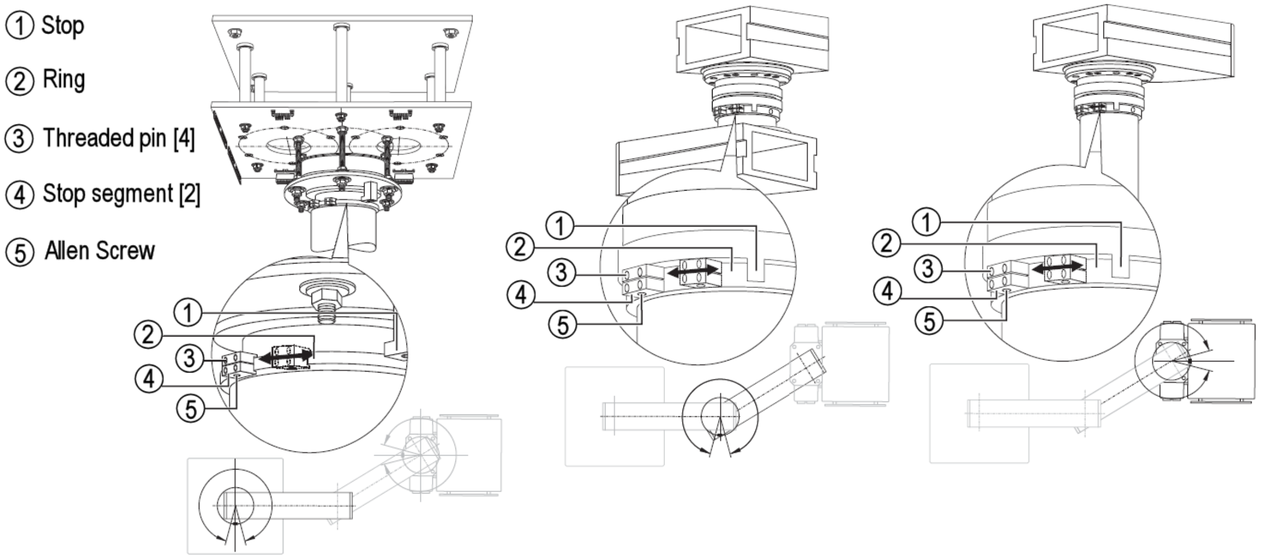
1. Remove the stop screw (1).
2. Install the stop screw (1) in the desired threaded hole (2) relative to the fixed stop (3) and tighten it.
3. Move or remove second stop screw if necessary.
4. Ensure that stop screws are in desired position and securely fastened by moving the boom

Caution **To prevent the internal supply lines from being twisted off, at least one stop screw (1) must be installed.**

11.4.2 OSC600

1. Loosen the socket-head screws (5) and four threaded pins (3) in the mounting flange mechanical stops.
2. Slide mechanical stops (4) on ring (2) to the desired position and tighten socket-head screws (5) and four threaded pins (3).
3. Ensure mechanical stops are seated securely.
4. Repeat for mechanical stops in middle bearing (if available).
5. Repeat for mechanical stops in service head bearing.

Note Adjust pneumatic brakes prior to installing covers.



OSC600 Adjustment

Caution **All tubing used inside Service Head is 4mm (5/32 inch) and uses quick release press-in fittings. To remove the tubing, press in on the ring next to the tubing and carefully pull the tubing out. DO NOT pull on the tubing without pressing in on the release ring or you could damage a component.**

6. Connect the tubing for supplying the brakes to the pressure regulator mounted above the Service Head.
7. Adjust the regulator for 80 (±5.0) PSIG.
8. Test the brakes:
   - Verify the arms remain in place with moderate force applied.
   - Press and hold down both brake buttons.
     You should hear a short hissing sound as the brake bladders bleed off. Ensure the Booms can be easily moved.
   - Individually check each arm by pressing one button at a time.

Note If air seeps continuously when a button is pressed, the lines connected to it may be reversed. The button should connect the source of air to the bladder when not pressed and shut off the air supply on Port One of the valve while venting Port Two to atmosphere.

12. Installing Covers

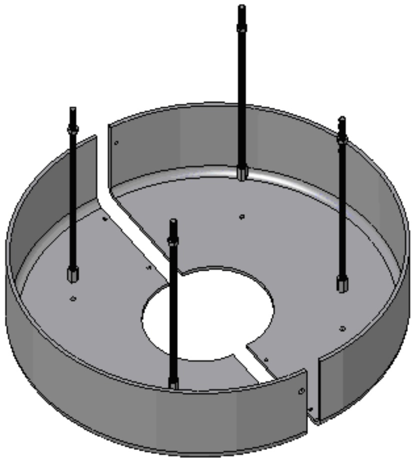
12.1 Lights and Flat Panel Suspension

1. Loosen the reducing ring and lower it until it rests on the upper Suspension Arm.
2. Assemble the two halves of the ceiling cover around the down tube above the reducing ring.
3. Install the ceiling gasket cover and around the top edge of the ceiling cover
4. Raise the ceiling cover and secure to the four threaded rods with the supplied screws.
5. Slide the reducing ring up to the ceiling cover and tighten.

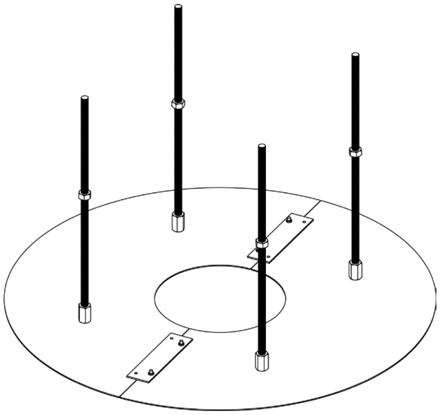
⚠ **Warning** **Failure to properly attach the ceiling cover may result in the ceiling cover falling during use!**

12.2 Booms

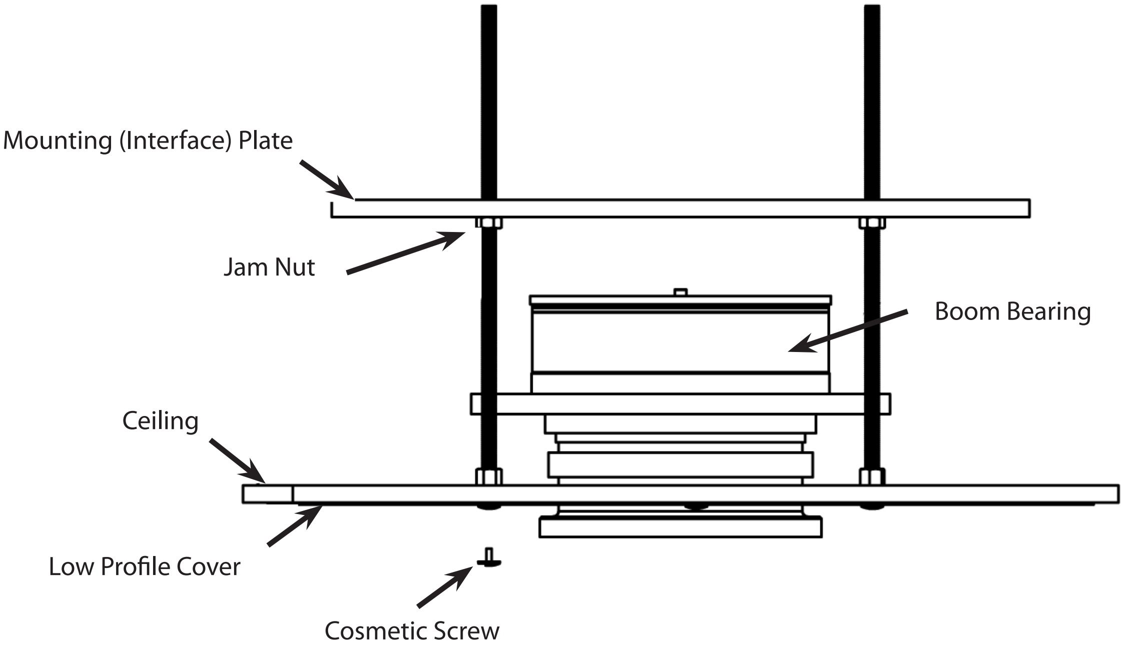
1. Install the four threaded rods into the Mounting (Interface) Plate
2. Use one-half of the ceiling cover as a guide to adjust the height of the four threaded rods. Tighten jam nuts against ceiling plate to secure rods in place.
3. Attach the ceiling cover to the four threaded rods with the supplied cosmetic screws.
4. Assemble two halves of the ceiling cover with remaining cosmetic screws.



Round, Single Suspension Ceiling Cover



Low Profile Single Suspension Ceiling Cover

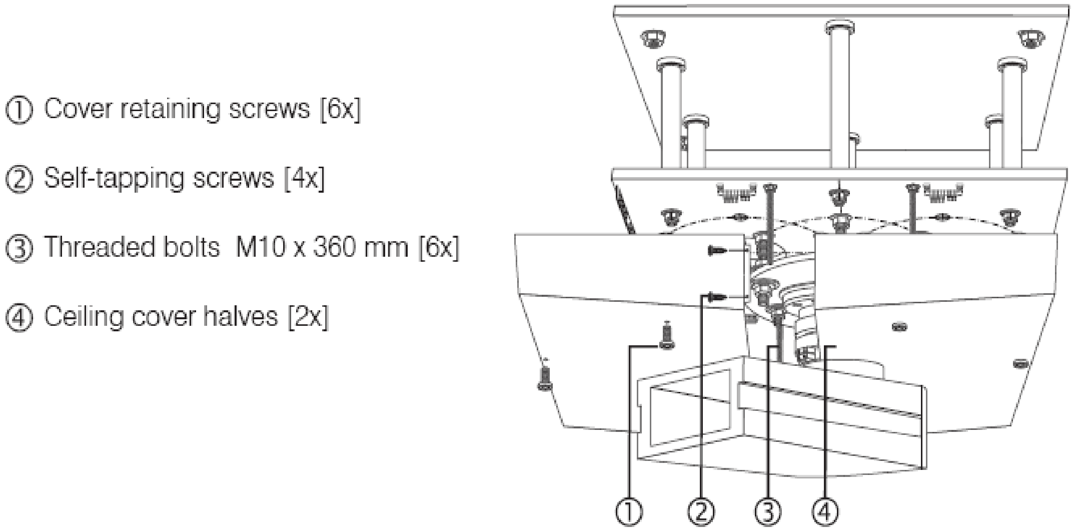

Mounting (Interface) Plate
Jam Nut
Boom Bearing
Ceiling
Low Profile Cover
Cosmetic Screw

Cross-Section View of Cover Installation
(Low-Profile Cover Shown)

⚠ **Warning** **Failure to properly attach the ceiling cover may result in the ceiling cover falling during use!**

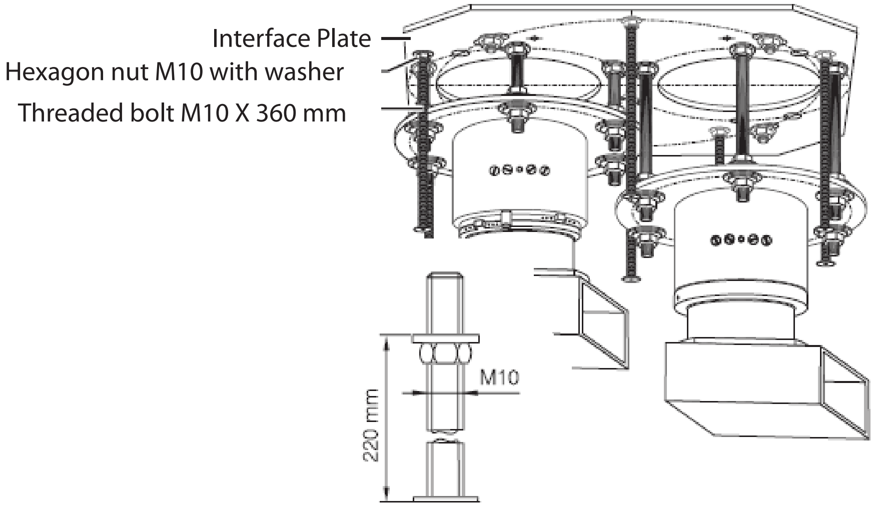
12.3 Tandem

1. Screw (M10) hex nuts with washers (#2 in figure below) on (M10 X 360mm) bolt (#3 in figure below).


① Cover retaining screws [6x]
② Self-tapping screws [4x]
③ Threaded bolts M10 x 360 mm [6x]
④ Ceiling cover halves [2x]
①
②
③
④

Ceiling Cover Installation

2. Screw bolts (#3 in previous figure) to interface plate and tighten. The washers and internal thread of the bolts should point downward. If installation site includes a false ceiling, bolts should extend approximately 4.1-4.7 inches (104-120mm) past the interface plate.



Ceiling Cover Installation

3. Align the mounting holes of the ceiling cover halves (#4 in the figure) with the threaded bolts (#3 in the figure) and join the two halves (#4 in the figure) using the cover tabs. The tops of the ceiling cover halves should be flush with the ceiling.

> **Note** Covers have two holes for tandem configurations. Use reducer rings to match cover diameter to mounting flange diameter. Use hole cover when single boom is mounted.

4. Secure the ceiling cover halves (#4 in the figure) by screwing the six cover retaining screws (#1 in the figure) into the threaded bolts.
5. Check ceiling cover halves (#4 in the figure) for secure fastening.

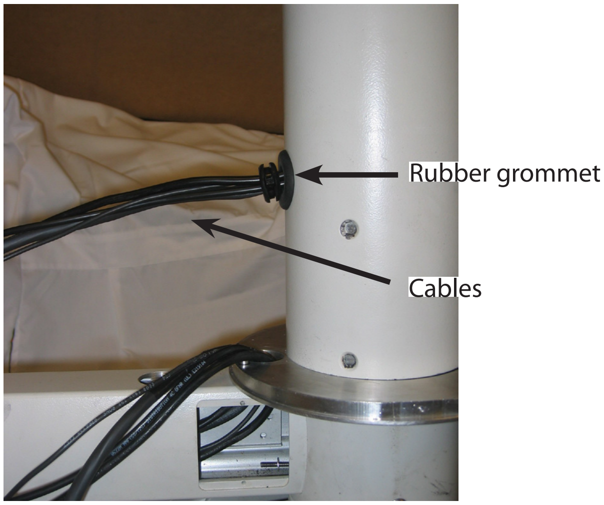
> **Note** If cover does not fit due to interference with boom parts, the boom may need to be repositioned on the all-thread rods.

> **Note** Ceiling cover may be circular.

> **Warning** **Improper installation of the Ceiling Covers may result in them potentially falling into the sterile field.**

12.4 Cable Covers

12.4.1 Flat Panel/Light/Light Suspension

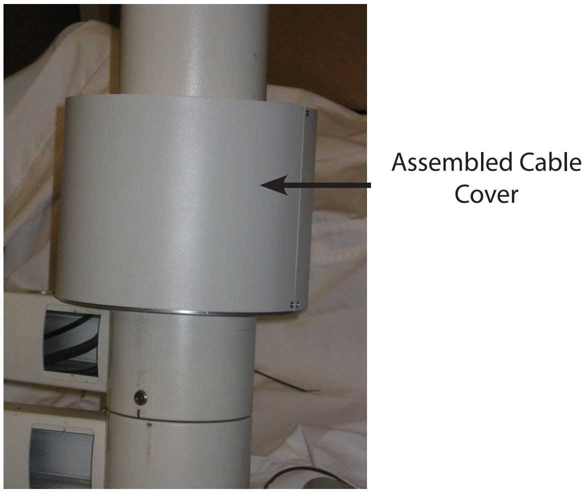


Flat Panel Monitor Cables with Grommet and Cable Tie

1. Route the Flat Panel Monitor cables through the one-inch opening in the down tube and attach the down tube to the suspension.
2. Rotate the upper extension arm in both directions to ensure that sufficient cable remains outside the down tube.

   The arm should be able to meet both limit stops.
3. Pull the cables out of the down tube an additional inch to ensure sufficient cable is available.
4. Wrap a split rubber grommet around the cables and secure the grommet with a cable tie.

   The rubber grommet prevents the cables from re-entering the down tube.



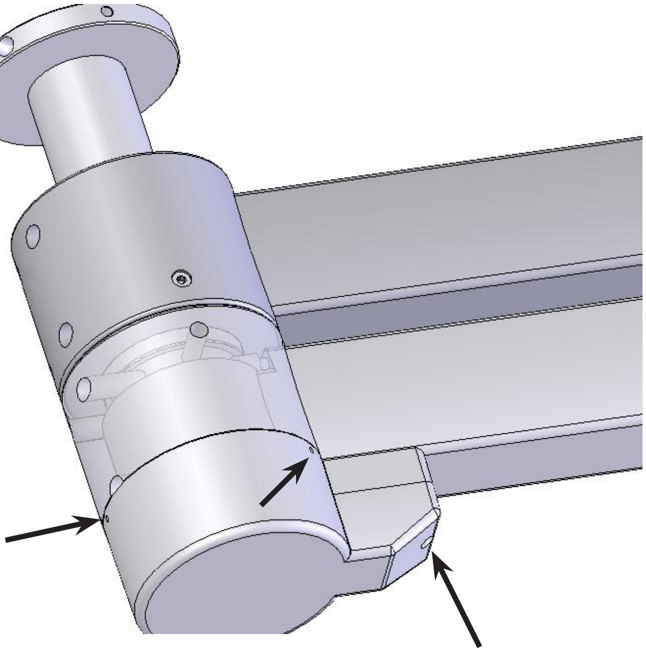
Assembled Cable Cover

5. Place the two halves of the Rotating Cable Cover around the down tube to conceal the cables.
6. Use two 6-sheet metal screws to attach the halves together.
7. Use four 6-32 screws to attach the cover to the base.

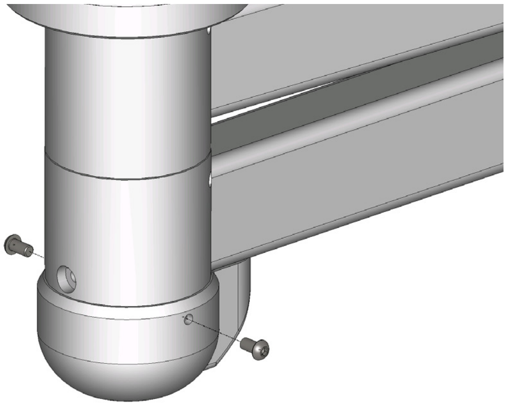
12.4.2 Light/Flat Panel Suspension - Teacup Installation

For SHA suspensions, fasten the dual suspension Flat Panel cable cover to the lowest Extension Arm with four M3x8 screws.

For EHA suspensions, fasten the dual suspension Flat Panel cable cover to the lowest Extension Arm with two M8x16 screws.



Three M3x8 Screws (one is not shown)
(For SHA only)



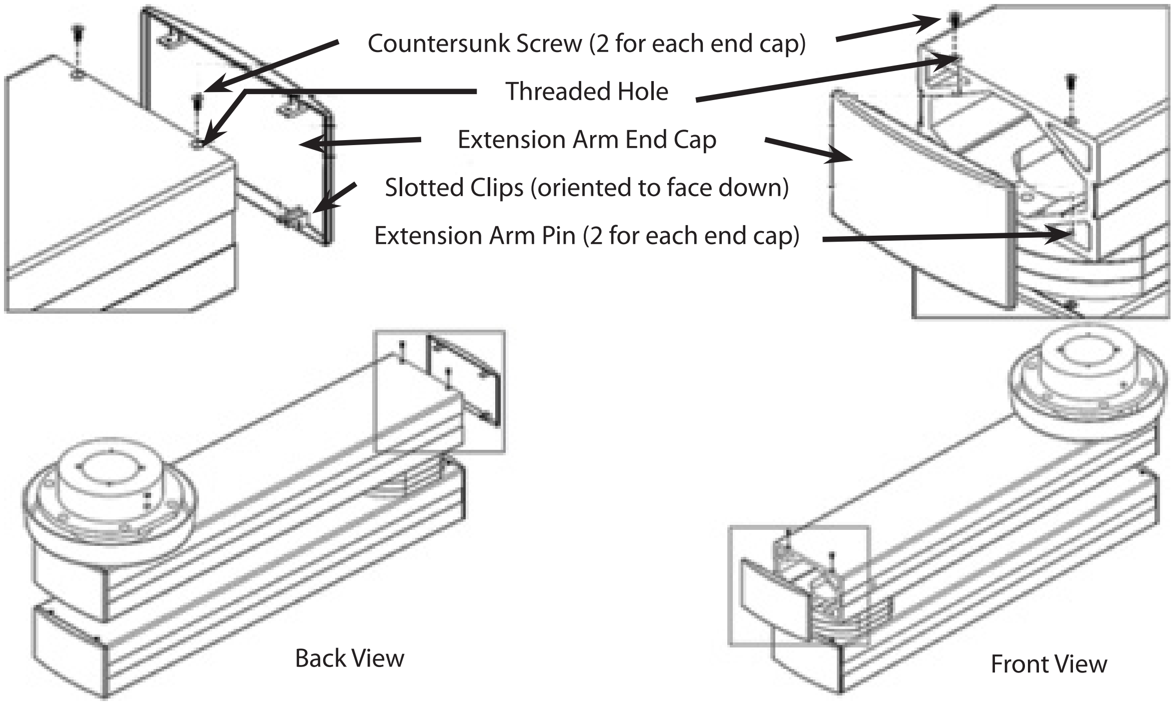
Two M8x16 Screws
(For EHA only)

12.4.3 MMP200, OSC400, and OSC600

> **Note** When removing the extension arm end cap, be sure to remove the two countersunk screws, securing it in place from the top of the extension arm. Be aware that the ceiling cover may have to be removed in order to access these screws.

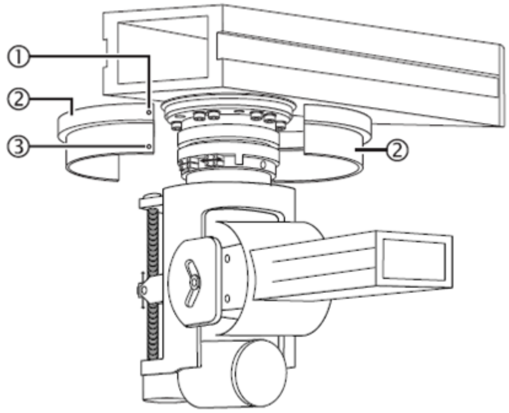
1. Orient the cap so that the slotted clips are facing downward and align them with the pins in the extension arm.
2. Push the end cap onto the end of the extension arm, snapping the slotted clips and pin together.
3. Secure the end cap with two countersunk screws.
4. Ensure that the end cap is securely attached to the extension arm.
5. Repeat for each end cap.

⚠ **Warning** **Improper installation may result in the end cap falling into the sterile field.**


Countersunk Screw (2 for each end cap)
Threaded Hole
Extension Arm End Cap
Slotted Clips (oriented to face down)
Extension Arm Pin (2 for each end cap)
Back View
Front View

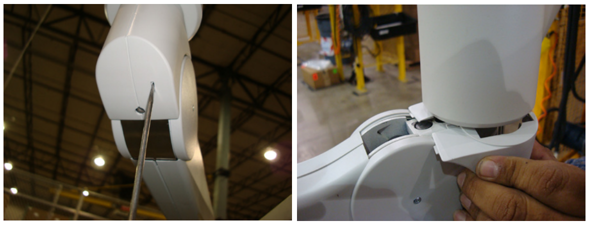
MMP200/OSC600/OSC400 End Cap Installation

12.4.4 Mounting Motor Ring Covers

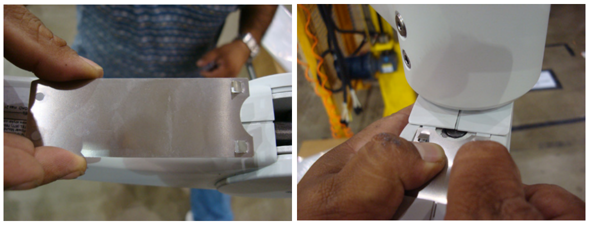


1. Place the semicircular covers around the motor arm bearing and fix into place by screwing in two plastic screws M3 X 8 mm and two MLF screws M3 X 6 mm
2. Check that the semicircular covers are securely in place.

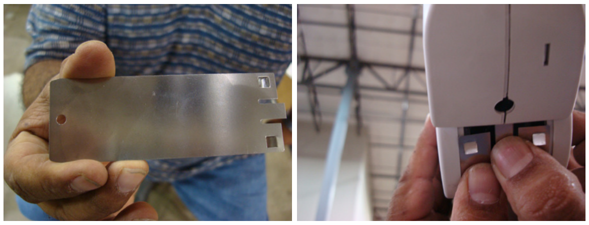
12.4.5 Replacing Rear End Spring Arm Covers



1. Use screw driver to separate covers.
2. Place new cover on spring arm.

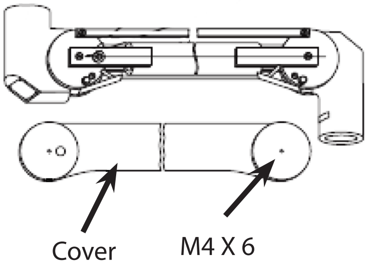


3. Insert flex strip with two holes on top.

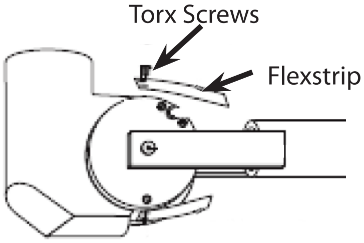


4. Insert flex strip with one hole on bottom.
5. Move spring up and down to make sure spring functions properly.

12.5 Installing a Flexstrip Kit (Dual Flat Panel Arm Only)

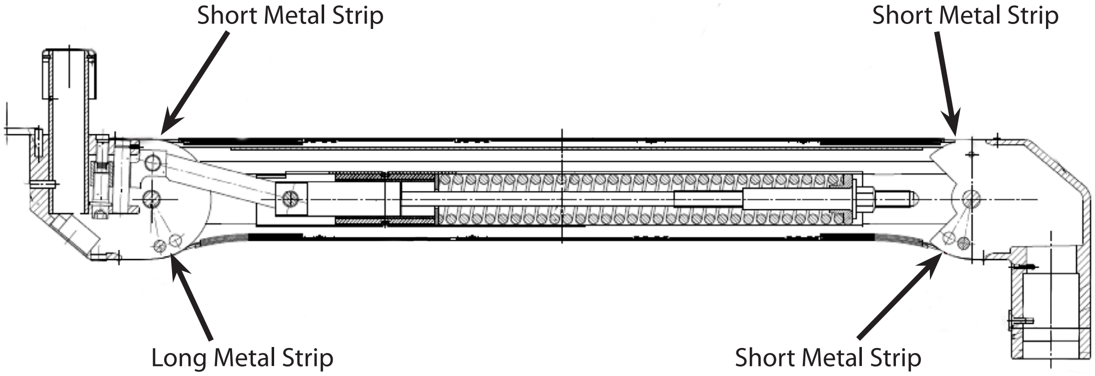


1. Undo the four M4x6mm Phillips screws and remove the covers.


Torx Screws
Flexstrip

2. Undo the two torx screws for each flexstrip and remove the flexstrips.

3. Screw the two cover halves tight using M4x6 mm Phillips screws.
4. Insert the long flexstrip into the guideway of the cover halves and screw tight with two torx screws.
5. Insert the three short flexstrip into the guideway of the cover halves and screw tight with two torx screws.


Short Metal Strip
Short Metal Strip
Long Metal Strip
Short Metal Strip

6. Check that the cover halves are securely in place.

13. Accessories

13.1 Lights

13.1.1 Halogen In-Light Camera and Weighted Light Handle Assemblies

1. Obtain Handle assembly.
2. Install two bulbs onto the Handle assembly.

Note DO NOT touch the bulb directly with your hands.

3. Position the light head so that it is on its side.
   With one hand on the hood of the light head, line up the connector of the handle assembly with the connector of the light head, and insert the handle assembly into the light head.
4. Tighten the three thumb screws.

WARNING **Failure to tighten the three thumb screws may result in the light handle assembly falling out during use!**

13.1.2 LED In-Light Camera and Weighted Light Handle Assemblies

1. Position the light head so that it is on its side.
   With one hand on the hood of the light head, line up the connector of the light handle assembly with the connector of the light head, and insert the light handle or camera assembly into the light head.
2. Tighten the three thumb screws.

WARNING **Failure to tighten the three thumb screws may result in the light handle assembly falling out during use!**

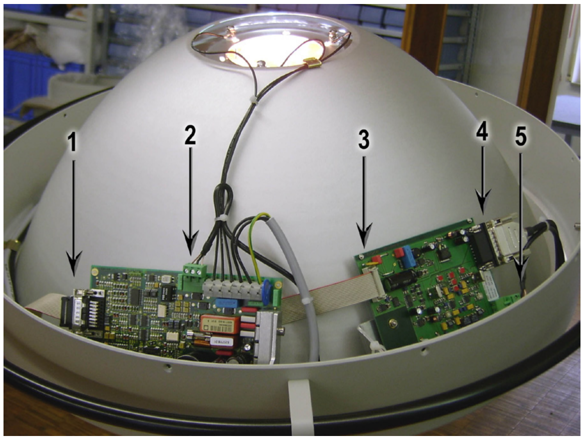
13.1.3 Field Upgrade for StrykeCam In-Light Camera

Ensure that the camera kit contains the following:

- In-Light Camera with integrated light handle assembly
- Image Data Transmitter circuit board
- Video and Camera Control board
- Counter weight for the light head

Caution Ensure proper ESD handling precautions are followed while handling all circuit boards.

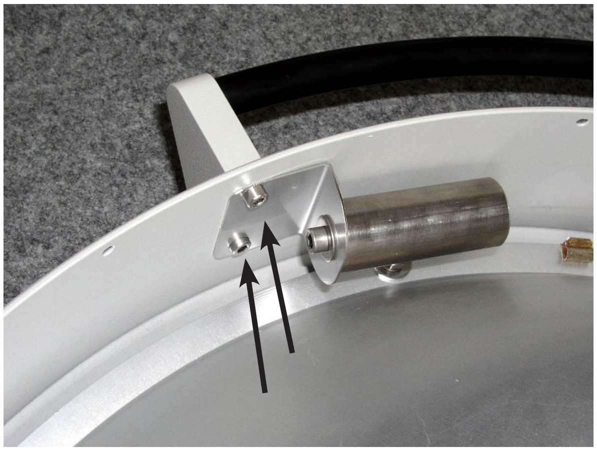
stryker COMMUNICATIONS
Product No.: 682-000-107
PRODUCT NAME: Lighthead for Stryker Visum Surgical Light System
SERIAL NUMBER: 302 011 0101 064 009

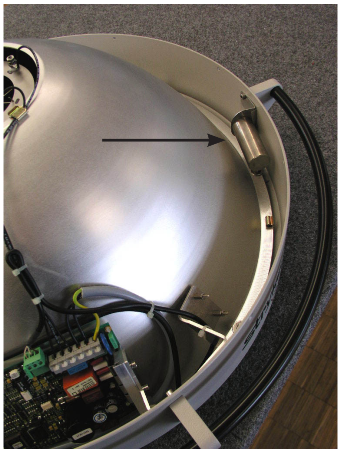


1. Remove the cover from the light head by removing the 10 Phillips head screws around the circumference of the light head.
2. Gently lift the light head cover from the Light.
3. Locate the Light Circuit Board and the Mount for the Image Data Transmitter board.
4. Place the Image Data Transmitter board near its mounting location but do not fasten yet.
5. Using the photo to the left, connect all of the electrical connectors.
6. Remove the original DB-15 connector from location 1.
    a. Connect it to location 4 on the Image Data Transmitter board.
    b. Remove the CAN Bus connector from point 2 and connect it to location 5 on the Image Data Transmitter board.
    c. Connect the ribbon cable from the Image Data Transmitter board shown in location 3 and dress it out behind the light circuit board and connect to location 1.
    d. Connect the CAN Bus connector from the Image Data Transmitter to the original light board in location 2. Dress the wiring using tie wraps as necessary.
    e. Using the supplied mounting hardware fasten the Image Data Transmitter board to the mounts.

7. Mount the camera counter weight to the light head cover using supplied hardware.

   The second counter weight mounts inside the light head using existing hardware that holds the hand rail onto the light head. If this weight is present, remove it.
8. Loosen both screws.
9. Remove bottom screws completely and swing the weight out of the way of the bottom screw hole.
10. Re-insert the bottom screw and tighten.
11. Remove the top screw and weight.
12. Replace top screw.



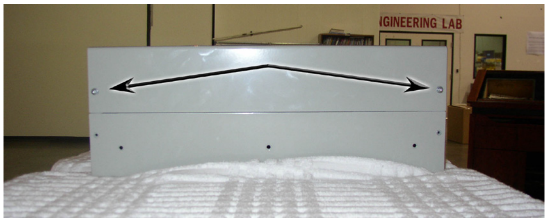


Note Do not place the cover on the light head until the entire procedure is complete and the camera has been tested and aligned.

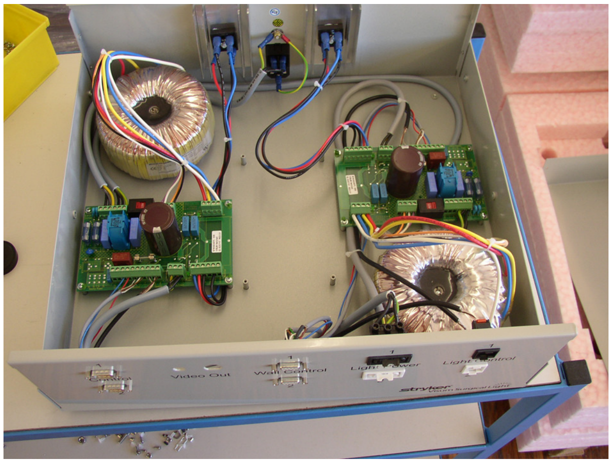
13.1.4 Power Supply Box Components

Caution Follow ESD prevention procedures.

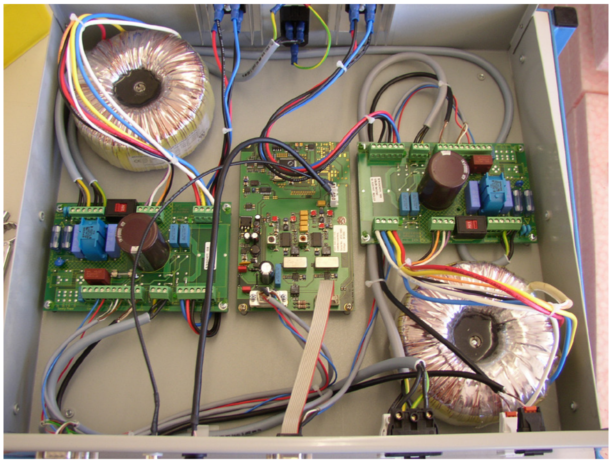
Warning **Ensure the power supply box is not connected to a power source prior to proceeding with the following instructions.**



1. Remove the cover to the power supply box (power supply box) by removing the four screws securing the top.
2. Locate the circuit board mount location between the two power supply circuit boards.

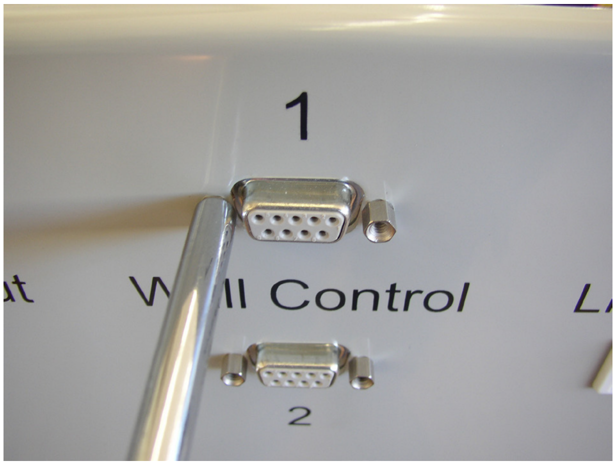


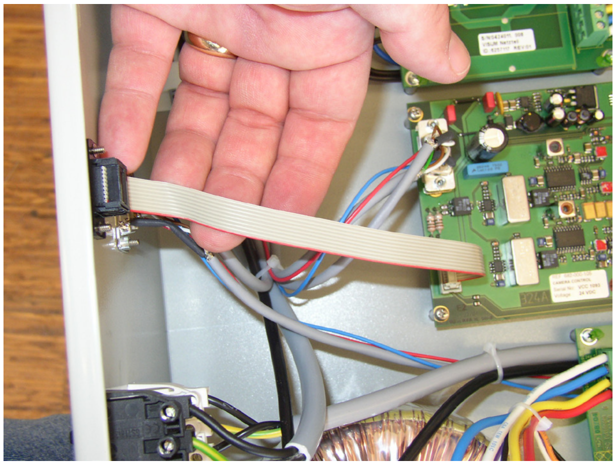
Without Circuit Board



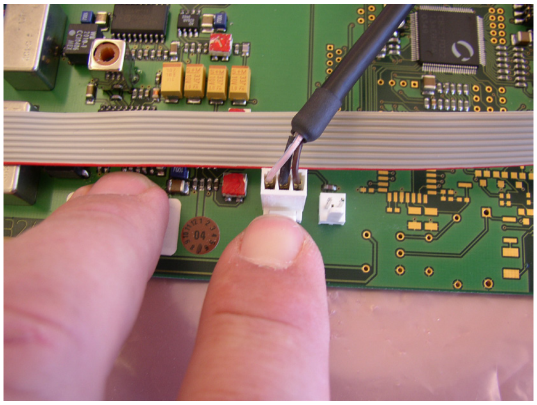
With Circuit Board

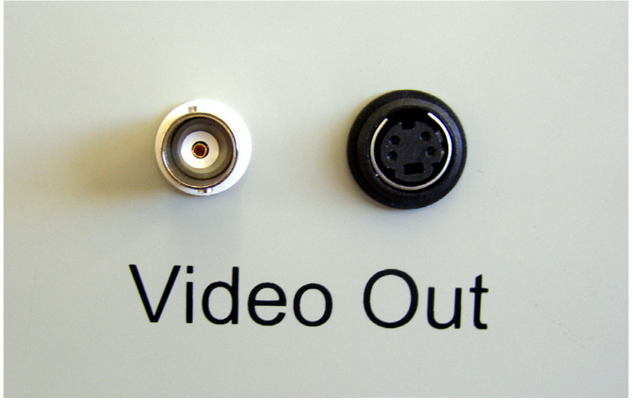
3. Mount the Camera Control and Video board in the power supply box using supplied hardware.
4. Remove the DB-9 connector from “Wall Control 1” position on the front of the power supply box.





5. Connect the female DB-9 connector removed from the power supply box to the male DB-9 connector on the Camera Control and Video board.
6. Mount the female DB-9 connector on the end of the ribbon cable from the Camera Control and Video board to the power supply box front panel.
7. Remove the video cables from the Camera Control board to allow them to be fed through the front of the power supply box. Use your finger to release the clip on the connectors.





8. Route the Video cables through the front of the power supply box. Mount them with supplied hardware.
9. Reconnect the video cables internally to the Camera Control and Video board.
10. Reinstall the cover on the power supply box.
11. Connect the power cable to the power supply box.

13.1.5 Camera Installation

Caution Follow ESD prevention procedures.

12. Remove the original light handle assembly.
13. Put two new light bulbs into the light bulb section of the in-light camera. Ensure they are properly seated and not tilted.

Note Do not touch the light bulbs directly with your fingers. This will shorten bulb life.

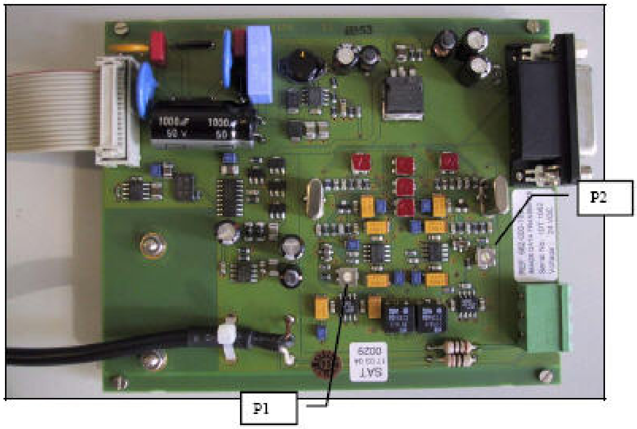
14. Install the in-light camera.
15. Adjust tension in the Spring Arm to compensate for additional weight of the newly installed camera.

After performing test and adjustments, reinstall the cover on the light.

Warning **Failure to tighten the three thumb screws may result in the In-Light Camera falling out during use!**

13.1.6 Testing

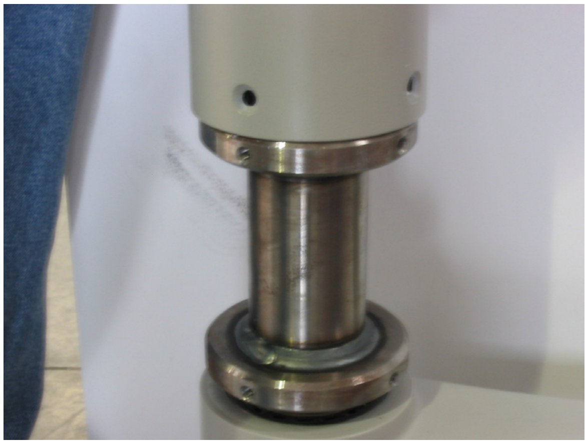
1. Turn the light on and verify that it functions normally and the wall touch panel controls the light.
2. Connect a monitor to the video output of the power supply box.
3. Allow the light to warm up for at least 15 minutes.
4. While monitoring the image quality, perform the following adjustments:



   a. Rotate Luminance Carrier level adjustment potentiometer P1 clockwise until the image is lost.
   b. Slowly rotate P1 counterclockwise until the image returns and is stable. Rotate 1/8th of a turn further counterclockwise.
   c. Rotate Chrominance Carrier level adjustment potentiometer P2 clockwise until the color signal is lost and the image is black and white.
   d. Slowly rotate P2 counterclockwise until the color returns to the picture. Rotate 1/8th of a turn further counterclockwise.

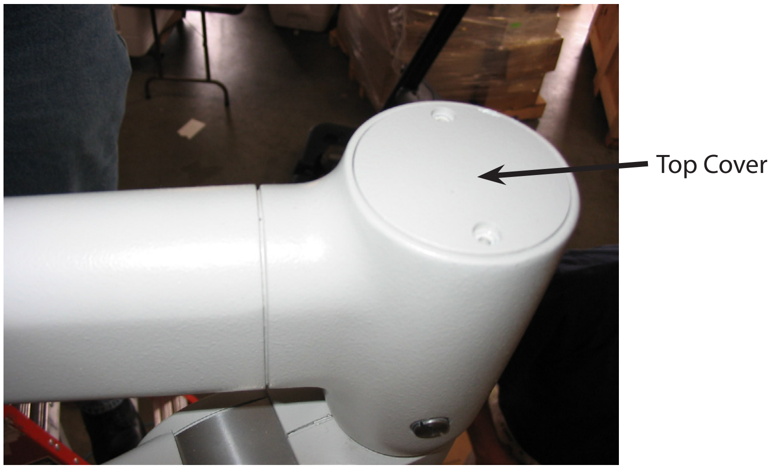
14. Legacy

14.1 Suspension Installation

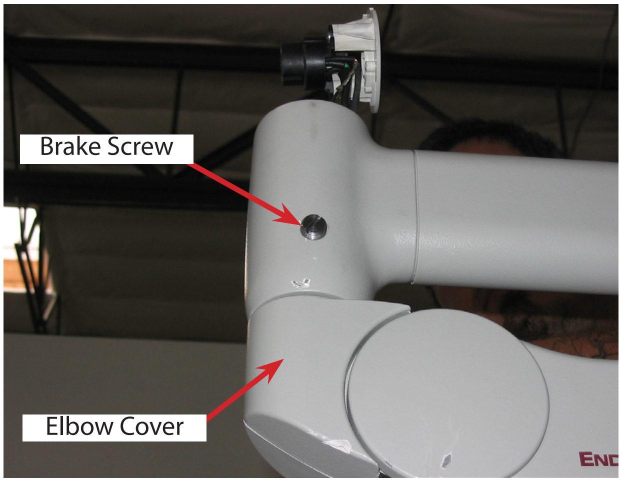


1. Assemble and hang suspension Assembly.
   a. If suspension is lights suspension only, attach down tube to suspension, slide reducing ring over down tube (set screws down), then attach flange to down tube, installing all six screws and bolts.
2. Place light suspension system securely on material-lift (e.g., Genie Lift).
3. Use cardboard to protect arm from scratching on lift.
4. Position material-lift directly under the ceiling mount.
5. Raise material lift up slowly, guiding ceiling mount onto the all-thread rods.
6. Pull all cables and electrical connections through mounting (interface) plate.
7. Using alternating bolts, only secure three hex nuts.
8. Using a Torpedo Level, level the flange to zero across three horizontal planes.
9. Install remaining three flat washers, lock washers, and hex nuts (24mm).
10. Remove original three hex nuts only and replace with three flat washers, lock washers, and hex nuts (24mm).
11. Tighten all six nuts.
12. Verify that the flange is level across three horizontal planes.
13. Lower the material lift and check light for steadiness.

14.2 Installing Spring Arms (if necessary for lights only suspension)



1. Remove top cover at the end of the Suspension Arm.

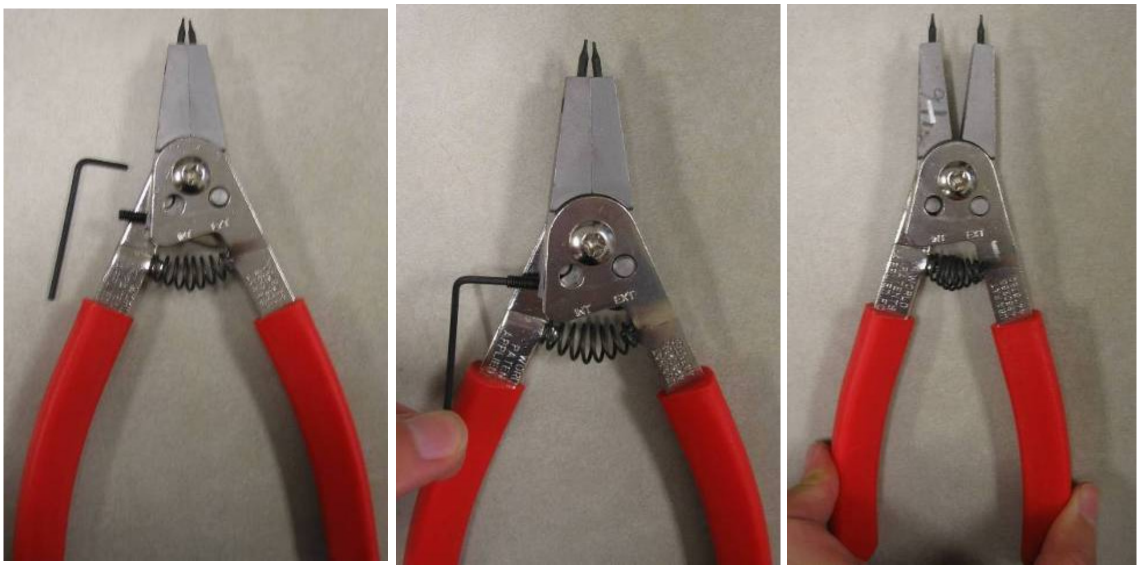


2. Loosen brake screws.

Warning **Ensure the elbow covers are snapped together tightly. Failure to do so may cause the elbow cover to fall into the sterile field.**

3. Prepare the snap ring pliers by locating the set screw on the side of the pliers. Use a hex key to turn the screw clockwise. Continue turning the screw until the gap at the tips opens to 15mm when fully extended.

Note It is important to set the stop at 15mm to prevent the retaining ring from being overextended.

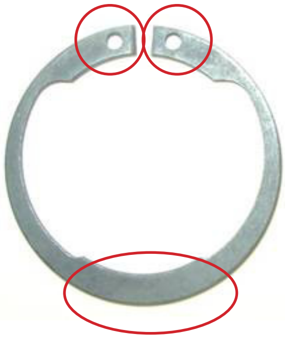


Setting the Snap Ring Pliers

4. Once adjusted, use snap ring pliers to remove the C-Clip and washer.

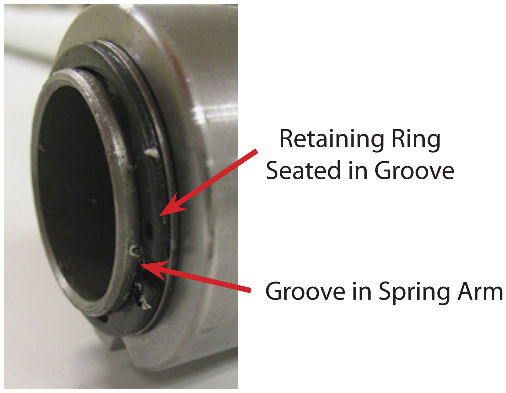
Note The new Spring Arm should have washers and a C-Clip. The C-Clip and first washer may require removal.

5. Insert washers into top of Suspension Arm.
6. Raise Spring Arm into the bottom of the suspension. Insert Spring Arm into Suspension Arm and tighten brake screws to hold.
7. Using the adjusted snap ring pliers secure the C-Clip over the pair of washers, making sure it fits securely in the groove at the top of the Spring Arm.
8. Visually inspect to verify that all three sides of the retaining ring are in contact with the inner channel.



Retaining Right Contact Points

9. Ensure the retaining ring is securely seated in its groove as shown in the next figure.

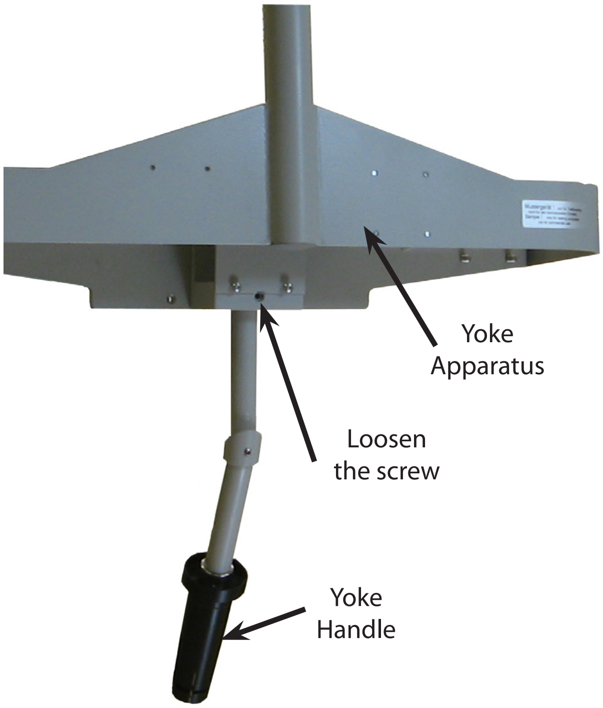


Retaining Ring Properly Seated in Groove of Spring Arm

⚠ **WARNING** **The C-Clip must be properly seated or the Spring Arm and light could fall.**

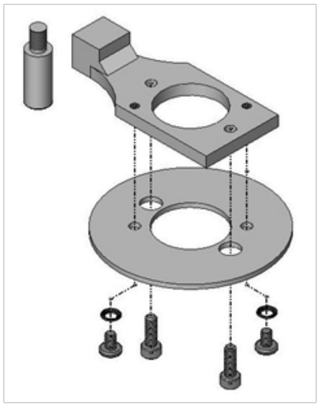
10. Replace top cover and ensure end cap is screwed down completely, check for proper keying of electrical connection (align big and little keys with slots).
11. Repeat as necessary.

14.3 Standard Width Yoke

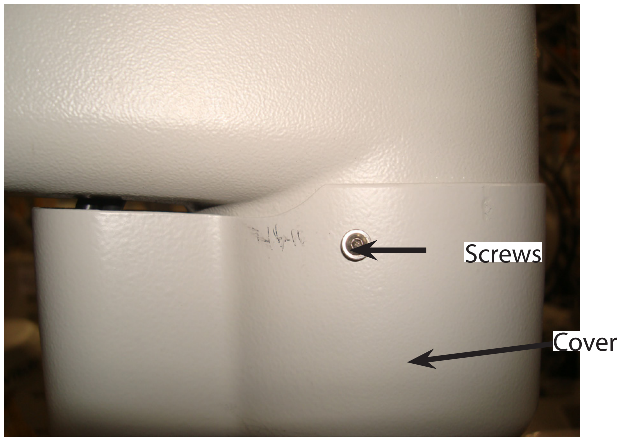


1. If yoke does not have a handle, follow the steps below:
    a. Loosen the middle screw on the yoke apparatus; do not remove the screw completely.
    b. Insert the handle and align the groove on the handle with the screw hole on the yoke apparatus.
    c. Tighten the screw to secure the handle in place.
2. Remove the shroud cover by removing the two knurled screws.
3. Install the Flat Panel Monitor on the Flat Panel yoke and complete all video and power connections.
4. Place the power brick in the special carrier.
5. Place cables in cable holders on inside of the Flat Panel Yoke so that no cables can be seen from the front or side. Secure the power cable in a similar fashion.
6. Place the shroud cover and the two knurled screws back into their original seating.

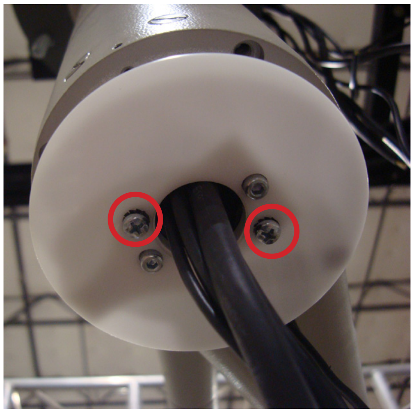
14.4 Halogen Light Flat Panel Stop Replacement



Light Flat Panel Stop Kit (0682-400-163)

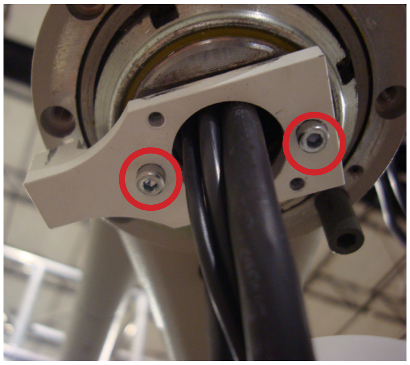


1. Remove the three screws and cover.



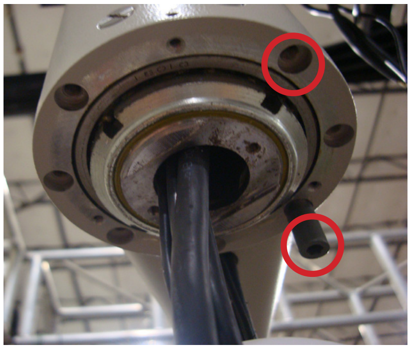
2. Remove two Phillips screws and white disc.

Note If white disc needs to be replaced, back pull bale through center hole in disc.



3. Remove the two Allen screws and white stop block.

Note If stop block needs to be replaced, back pull cable through center hole in disc.



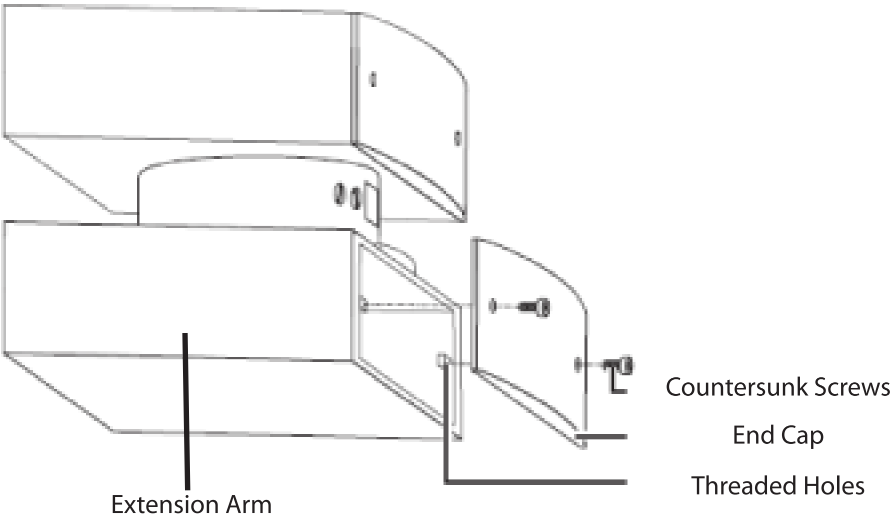
4. Place the stop pin in any existing stop placement that is suitable to customer needs.

Note If existing stop pin has been sheared, leave the sheared pin in existing hole and place a new stop pin in any existing stop placement that is suitable to customer needs.

5. Perform the above steps in reverse to complete the installation.

14.5 Variant

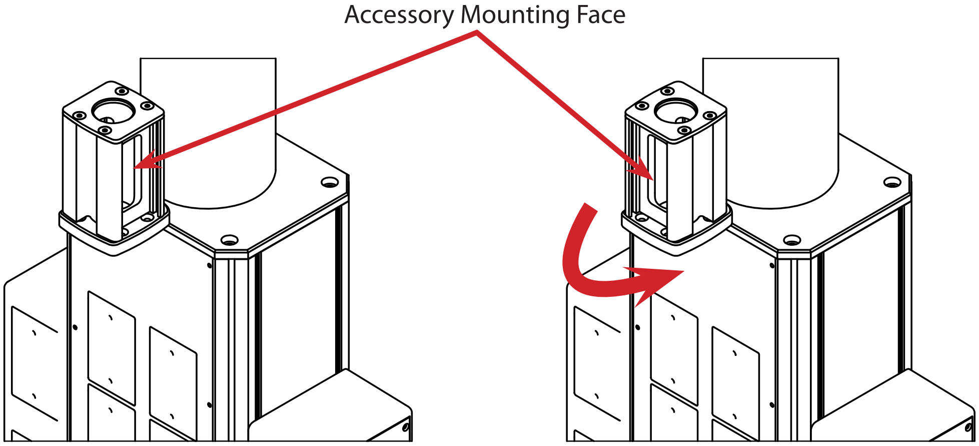
1. Place the end cap onto the extension arm and secure it using two countersunk Phillips screws.
2. Check the extension arm end cap and countersunk Phillips screws to ensure they are securely fastened.
3. Repeat for each end cap.

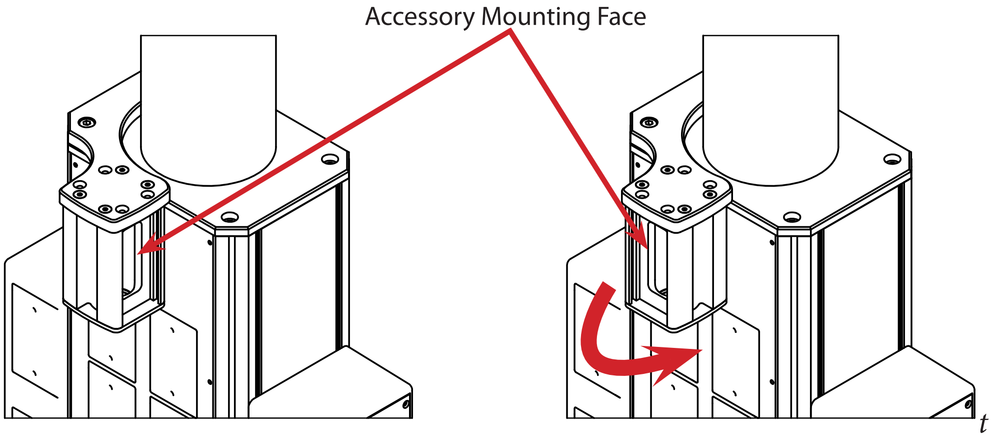

Countersunk Screws
End Cap
Threaded Holes
Extension Arm

Variant End Cap Installation

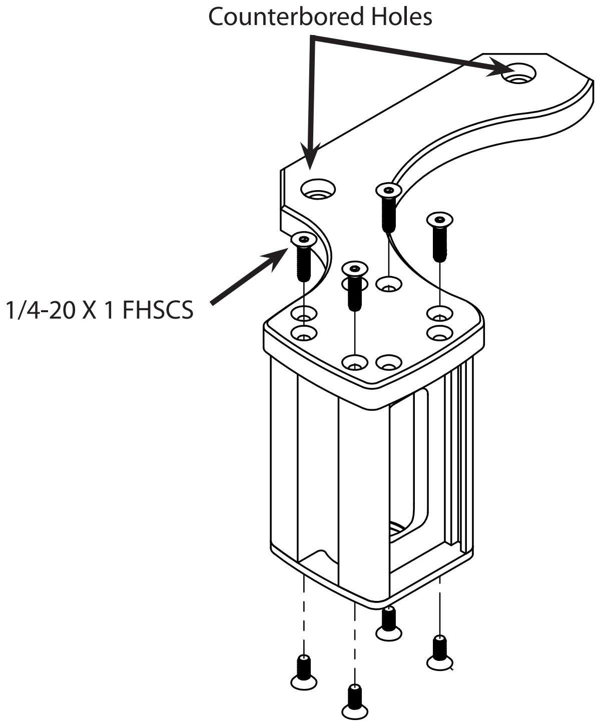
14.6 Installing GCX Accessory Track on OSC400 Service Head

1. Determine the desired mounting configuration, as shown in the proceeding figure. The track can be oriented upward or downward and can be rotated so that the accessory mounting faces point to the sides or forward.


Accessory Mounting Face

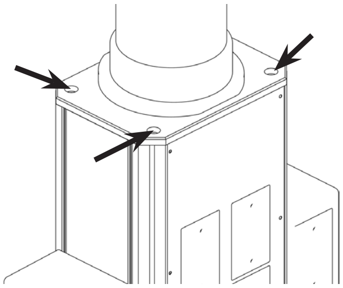


Accessory Mounting Interface



2. Attach the accessory track to the mounting bracket in desired configuration with four 1/4-20 X 1 FHSCS. Note that the counterbored holes on the mounting bracket will point upward when mounted on the service head.
3. Remove all equipment from service head, including equipment on shelves, flat panel monitors, accessory arms (SHAPE Arms, other GCX accessories), IV poles, etc.

⚠ **WARNING Failure to remove all equipment from service head before installation can result in injury or damage to the service head and equipment.**

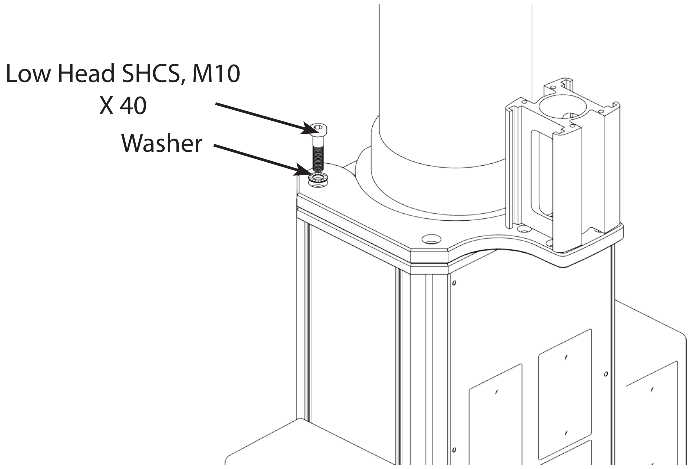


4. Remove and save cosmetic caps from screws in top of service head.
5. Determine the direction in which the mounting bracket will be oriented and remove the screw and washer from the hole in the top plate that will be under the rear of the mounting bracket. Save washer, but discard screw.

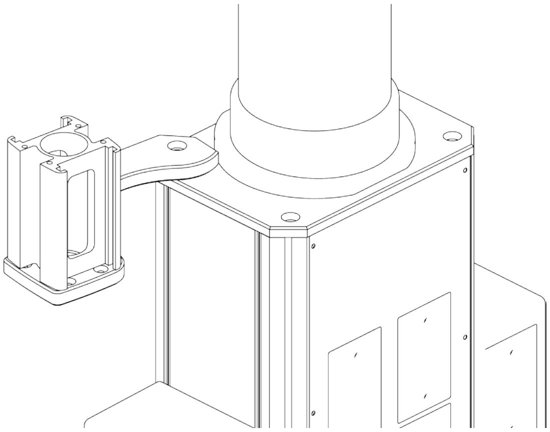
WARNING **Remove only one screw from service head top plate. Simultaneous removal of multiple screws can result in injury or damage to the service head and equipment.**

6. Use the Low Head, M10 X 40 SHCS that is supplied with the bracket to attach back of bracket to the service head and tighten. Do not reuse the screw that was removed from the service head.

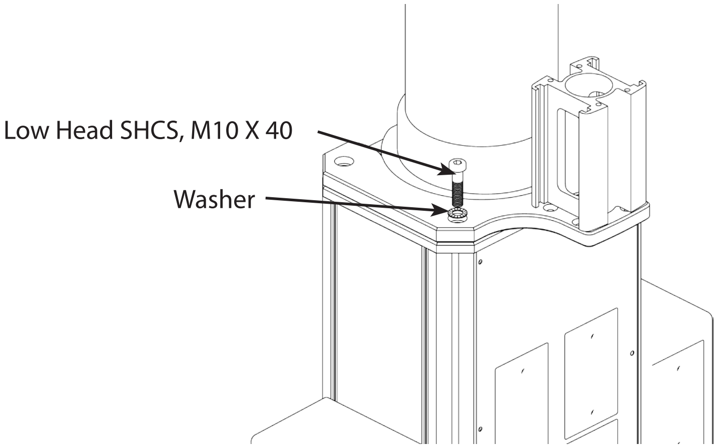
WARNING **Reusing the 30mm screw that was removed from the service head to attach the bracket can result in injury or damage to the service head and equipment. Use the Low Head, M10 X 40 SHCS that is supplied with the bracket.**



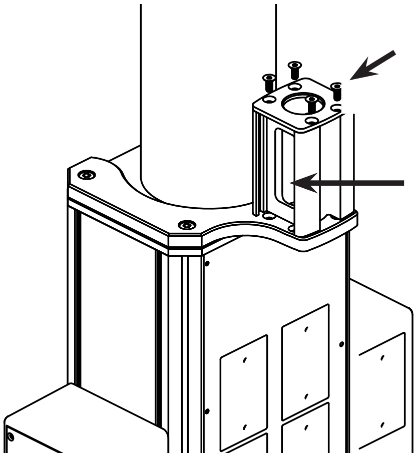
7. Rotate the bracket away from service head and remove the opposite screw and washer. Save washer but discard screw.



8. Use the Low Head, M10 X 40 SHCS that is supplied with the bracket to attach front of bracket to the service head. Do not reuse the screw that was removed from the service head.



9. Tighten both mounting screws with 7mm Hex Wrench and attach cosmetic caps.


1/4-20 X 5/8 FHSCS
Install GCX Accessories

10. Install GCX accessories in track and install track cap with (4) 1/4-20 X 5/8 FHSCS.

15. Cleaning and Completion

On a ladder, start cleaning at the top of the suspension addressing the ceiling cover and the down tube.

1. Clean the face glass.
2. Provide the primary hospital contact with extra bulbs (halogen only) and sterilizable handles.
3. (In-Service Biomedical and/or maintenance on the lighting system) Focus primarily on brake adjustments, bulb change, and replacing the electrical board in the light head.
   Review the service plan with the hospital contact.
4. Contact the shipping and receiving representative and notify them that the crates are ready for waste removal.
5. Perform the appropriate QIP for the installation and return to Stryker Communications.
6. Fill out a DHR and mail it to the Designate at Stryker.

16. Servicing the Visum 600/450

The various functions of the lights can be operated with the help of a wall control, which communicates with the controls via a CAN bus.

These functions are explained with user-friendly symbols on the wall control. An external power box is the power supply for all the electronic circuits. A lighting system always consists of two independent lights. One light is set up for a camera system to allow for live recording sessions during surgery.

16.1 Electronic Control System

The electronic control system is designed to control the brightness of halogen lights in medical OR lights. The principle is based on a phase-angle control of the input voltage to effectively control the output voltage for the light.

This function includes:

- Brightness control of the halogen light
- Identification of a defective light, including mechanical switch to a back-up light
- Communication with peripheral devices via CAN bus
- Optional input and output
- Integration of an RS-232 interface
- Connection setup for an electronic camera
- Temperature measurement of the cooling element

The direct voltage (abbreviated DC) is chopped by the electronic circuits. The pulse/no pulse ratio of the resulting PWM signal varies according to the supply voltage and the brightness level settings. Smoothing and stabilizing processes produce the effective light voltage that is supplied to the light.

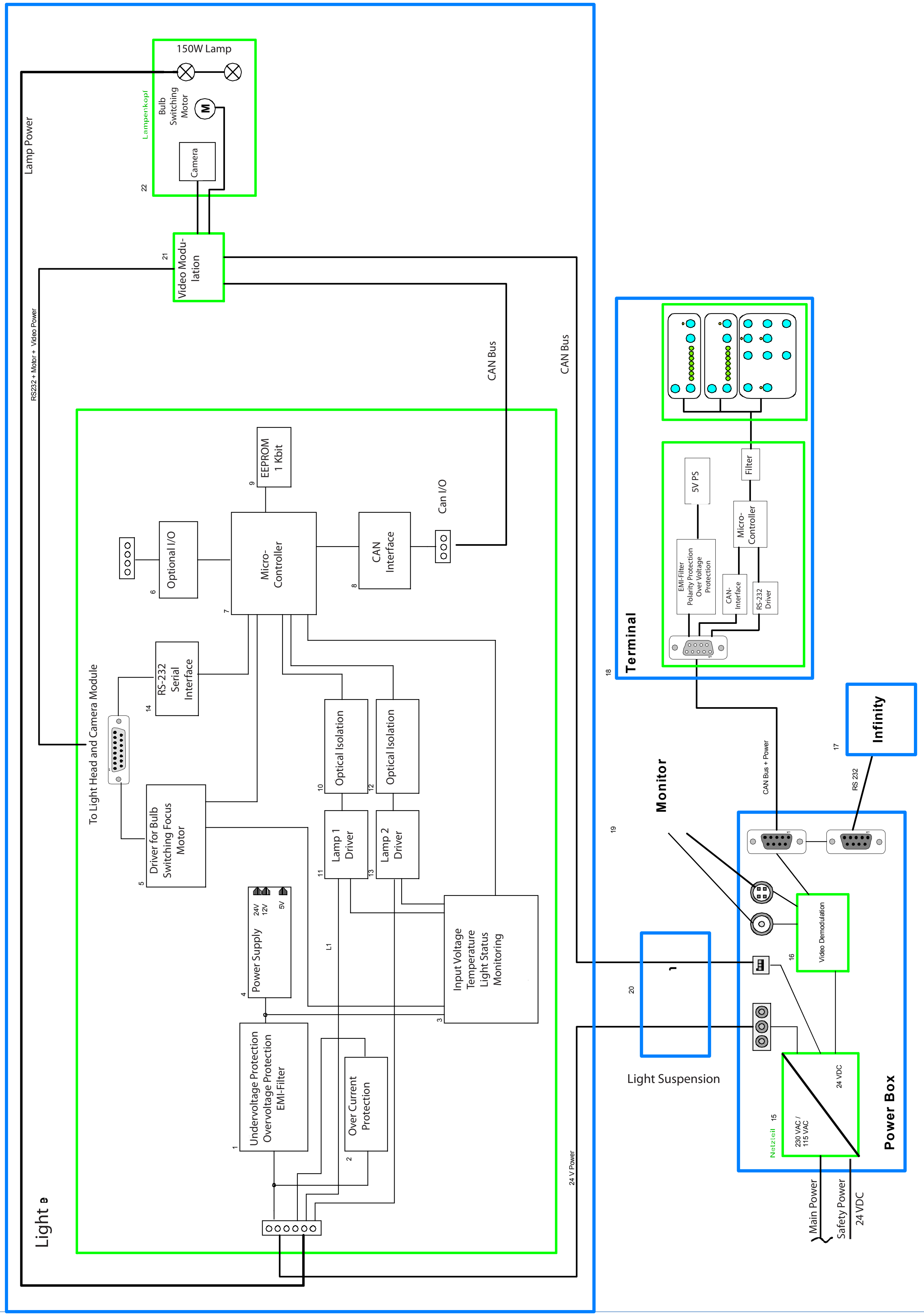
Using the figure on the following page as a reference, ensure the supply voltage for the low current branch is routed over an input filter circuit (1). This filter circuit complies with the EMC and offers polarity reversal protection and peak limiting. This is followed by several supply voltages (4).

The high current branch, which is designed to supply the lights, has been fitted with a separate polarity reversal protection (2).

The input voltage is recorded by two independent measuring circuits (3). The micro-controller (7) calculates the necessary pulse/no pulse ratio to activate the light driver (11 or 13). The supply voltage is forwarded in full strength to the light (L1 or L2). When the previously calculated time window has reached the effectively set voltage of the light, the driver (11 or 13) opens the ground connection so that no more current can continue to flow. After a defined frequency ratio, (PWM pulse/no pulse) the driver is closed and the current can flow again.

To maintain a decoupling between high current branch and MC, galvanized isolation is implemented by means of the optocouplers (10 and 12). Two independent light branches (L1, 11, 10 as well as L2, 13, 12) have been provided for the event that one of the lights becomes defective. A motor is activated to change the light (5 + 22) when the electronic circuits recognize by way of the probe (3) that a light is defective and the second light is automatically swiveled into the center of the mirror. This back-up light starts to generate light and a “defective light“ message is sent to the wall control.

The control assembly contains an optional digital output drive and a digital input (6) for possible additional functions.


Light
150W Lamp
Lampenkopf
Bulb Switching Motor
M
Camera
22
Lamp Power
21
Video Modulation
RS232 + Motor + Video Power
CAN Bus
CAN Bus
To Light Head and Camera Module
EEPROM 1 Kbit
9
Optional I/O
6
Micro-Controller
7
CAN Interface
8
Can I/O
RS-232 Serial Interface
14
Driver for Bulb Switching Focus Motor
5
Optical Isolation
10
Optical Isolation
12
Lamp 1 Driver
11
Lamp 2 Driver
13
Power Supply
24V
12V
5V
4
L1
Input Voltage Temperature Light Status Monitoring
3
Undervoltage Protection Overvoltage Protection EMI-Filter
1
Over Current Protection
2
24 V Power
20
Light Suspension
18
Terminal
EMI-Filter Polarity Protection Over Voltage Protection
5V PS
Filter
Micro-Controller
CAN-Interface
RS-232 Driver
19
Monitor
CAN Bus + Power
17
Infinity
RS 232
16
Video Demodulation
Netzteil
15
230 VAC / 115 VAC
24 VDC
Power Box
Main Power
Safety Power
24 VDC

Electronic Control System

The parameters required for the alignment and the proper functions of the control board are stored in an EEPROM (9). This EEPROM retains its programmed data without external supply voltage.

16.2 Power Supply Box

The power box contains a mains adaptor (15), which is responsible for the power supply of all electronic circuits. The division of the wiring of the whole system takes place here. The wall control may be connected to a monitor, an external PC system (Control) and the wiring for the light in the support arm.

There is a switchover option for 115V~ / 230V~ on the mains adaptor circuit board (15). To access it, open the housing and bring the slide switch on both circuit boards into the corresponding desired position.

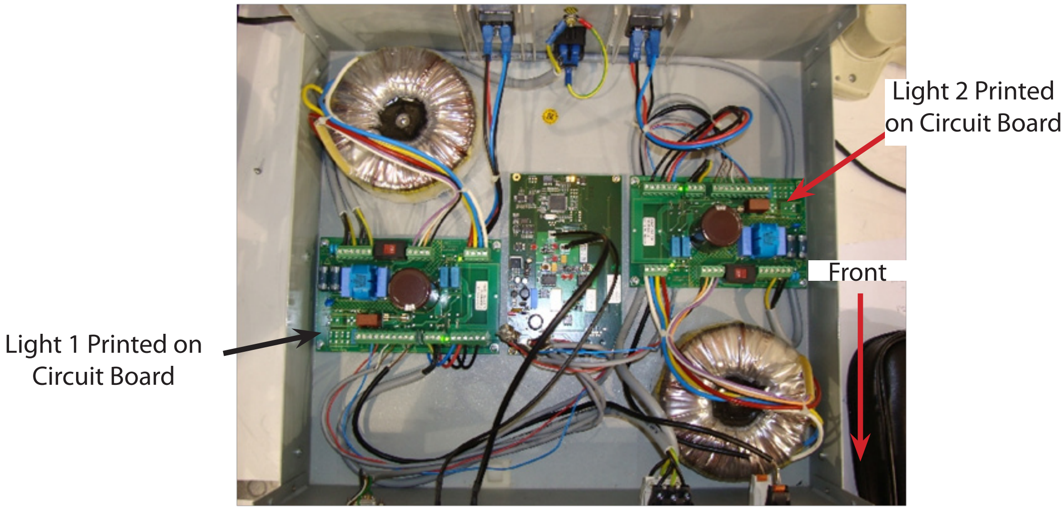
Safety Power is also brought into the power supply box directly as 24VDC. Should the mains power fail, an internal relay will switch over to supply the safety power to the light.

Since a system always consists of two independent lights, as well as a camera, two individual mains adaptors and a connection for a potential camera have been provided. Should a camera be retrofitted, the system can be expanded by simply plugging in or screwing in a video demodulator (16).

The electronic control system communicates through the CAN interface (8). When a camera is added, the CAN bus is looped over the video modulator (21) and then led over the support arm system (20) to the power box. The bus reaches the support arm system directly when no camera is added. The bus is then led over the mains adaptor (15) of the camera demodulator (16) to the terminal (18).

16.2.1 Halogen Power Supply Box Troubleshooting Guide

1. Are both lights out and unable to be turned on? If yes, go to the next step. If no, skip to Step 6.

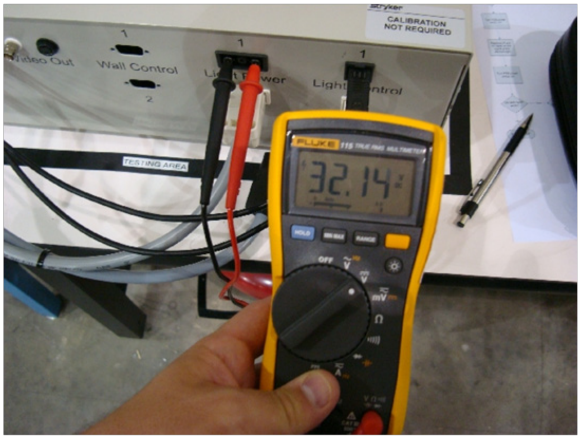

Light 2 Printed on Circuit Board
Front
Light 1 Printed on Circuit Board

Halogen Power Supply Box Overview

2. Check the Power output on L1 and L2 by doing the following:

> **WARNING To avoid the risk of electrical shock, all service must be provided by authorized personnel.**

   a. Set multimeter to VDC mode.
   b. Insert multimeter leads as shown in Figure 2.

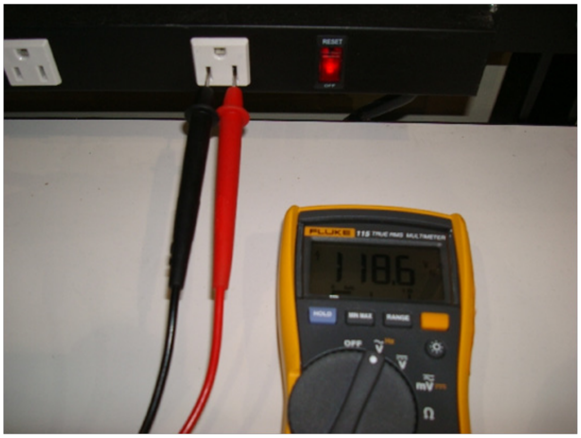


Power Supply Box DC Voltage Measurement

c. Voltage output should be 33VDC +/- 1VDC.
d. If L1 & L2 both have 33VDC power out the power supply is not the cause of the problem. Continue troubleshooting the rest of the light system.
e. If L1& L2 do not have 33VDC power out, go to step 3.0.
f. If only one light has 33VDC power out go to step 6.0 to troubleshoot the side that does not have power out. Investigate the rest of the light system to determine why the light that is getting power from the power supply box is not working.

3. Is the power supply box plugged in? If yes, go to the next step. If no, plug in the power supply box and check the light system for normal operation, as per QIP07056.
4. Is the power supply box power switch in the ON position? If yes, go to Step 5. If no, turn the power switch to the ON position and check the light system for normal operations, as per QIP07056.
5. Does the AC outlet have line power when measured at the wall outlet?

⚠ **WARNING** **To avoid risk of electrical shock, all service must be provided by authorized personnel.**



Line Voltage Measurement

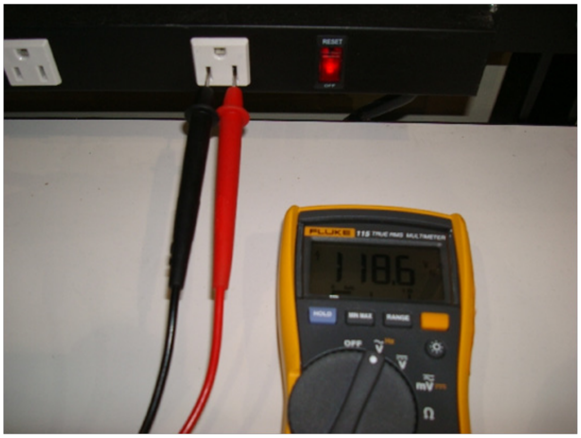
a. Set multimeter to VAC mode.
b. Insert multimeter leads into the outlet as shown in the figure below.
c. Voltage output should be 110-120VAC for 0682-000-055 power supply boxes. Voltage output should be 220-240VAC for 0682-000-055i international power supply boxes.
d. If line power is present and at the correct voltage, then replace the power supply box and return it to Stryker Communications through the RMA process.
e. If line power is not present, investigate the reason for this. Check the system for proper operation once line power is restored, as per QIP07056.

6. For a single line that is out, check the power output on the affected light.
   a. Power cycle the power supply box by turning the switch on the back of the box off then back on.
   b. Does the affected light turn back on? If yes, then investigate the rest of the light system for a CAN-BUS problem. If no, then continue to the next step.

> **WARNING** **To avoid risk of electrical shock, all service must be provided by authorized personnel.**

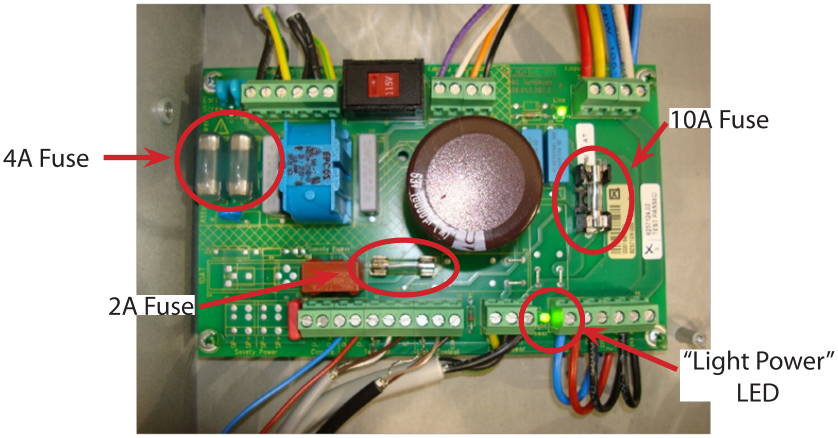
- c. Set multimeter to VDC mode.
- d. Insert multimeter leads as shown in the previous figure.
- e. Voltage output should be 33VDC+/- 1VDC.
- f. If the light that is not working has 33VDC power, the power supply is not the cause of the problem. Continue troubleshooting the rest of the light system.
- g. If the affected light does not have 22VDC power out, go to the next step.

7. Troubleshoot internal power supply components.
    - a. Turn the power supply box power switch to the OFF position.
    - b. Remove the top cover from the power supply box by removing the four Phillips screws from the sides.
    - c. Inspect the inside of the power supply box for obvious damage to the internal components such as physical damage to circuit boards or electrical components, damaged/loose wiring, and blown fuses.
    - d. Turn the power supply box power switch to the ON position.



Line Voltage Measurement

- e. Check if the “LIGHT POWER” LED is illuminated for the affected light as shown in the figure below.
- f. Using a non-conductive tool, tap the 10A fuse on the power supply box while watching the “LIGHT POWER” LED. Check to see if the “LIGHT POWER” LED flickers when tapped (this can indicate a cold-solder failure on this component).
- g. Turn off power to the power supply box.
- h. Remove the 10A fuse and discard it.
- i. Install a new 10A fuse.
- j. Turn the power supply box power switch to the ON position.
- k. Does affected light turn on? If yes, then replace the cover on power supply box and test the light system for normal operation, as per QIP07056. If no, proceed to the next step.



Power Supply Board Fuses and LEDs

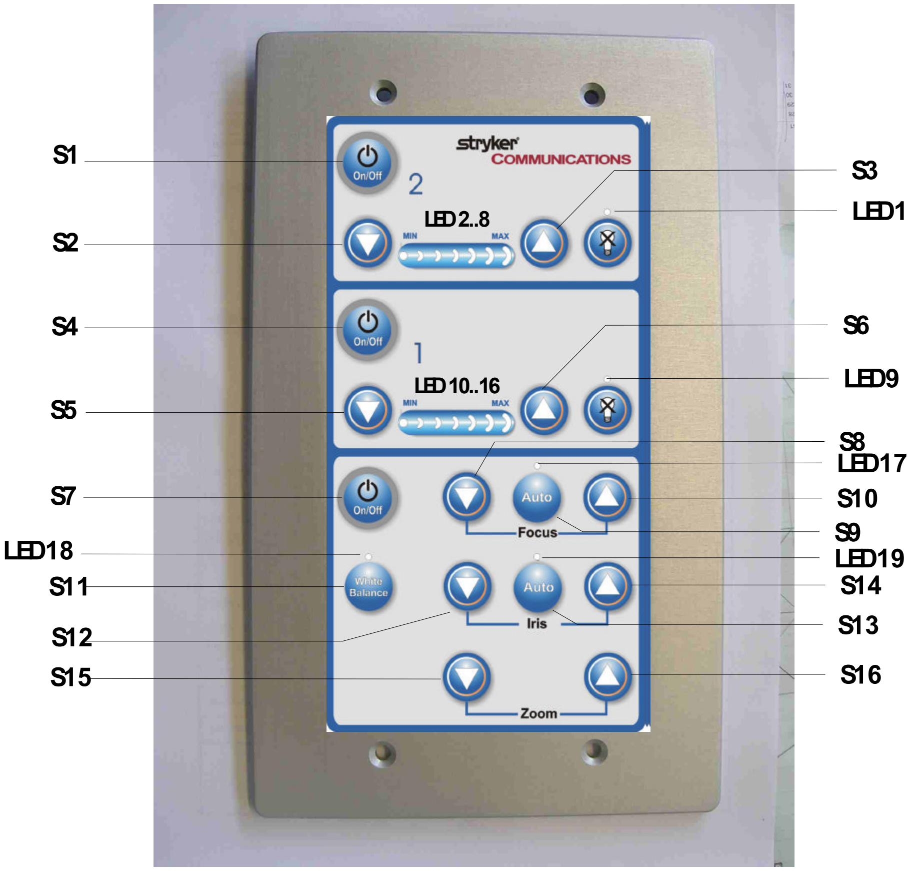
l. Turn power supply box power switch to the OFF position.
m. Remove and discard the old 4A fuses on the power supply box motherboard and replace with new 4A fuses.
n. Remove and discard the 2A fuse on the power supply box motherboard and replace with new 2A fuses.
o. Turn power supply box switch to the ON position.
p. Do both lights work? If yes, then replace the power supply box cover, check the system for normal operation, as per QIP07056. If no, replace the power supply box cover, remove the power supply box and return it to Stryker Communications using the RMA process. Install a replacement power supply box and test the light system for normal operation, as per QIP07056.

16.3 Wall Control

The wall control consists of a front panel with LED display and keys for user input. The electronic circuit with a micro-controller is located behind the front panel. It is responsible for processing the user input for camera and light controls and for output certain operating conditions on the LEDs. Communication with the primary electronic control system takes place via the CAN bus. The electronic control system of the terminal has a 9-pole sub-D plug. All control signals (CAN, serial) and the voltage supply utilize this plug. The circuits are connected separately to comply with EMC regulations.

The terminal has two equivalent electronic control systems, because every light system consists of two independent lights.

The functions of the terminal are briefly described in the following diagram.

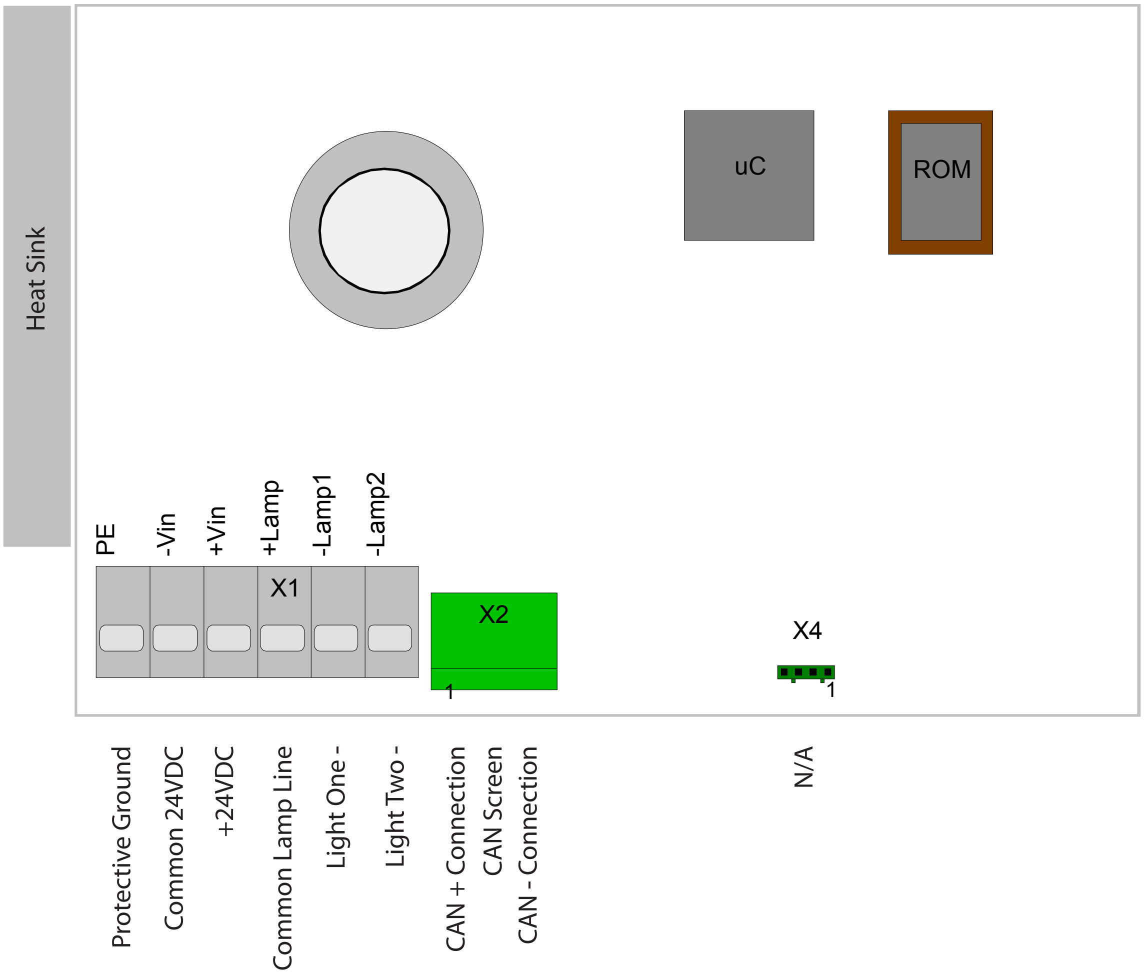

S1
S2
S4
S5
S7
LED18
S11
S12
S15
S3
LED1
S6
LED9
S8
LED17
S10
S9
LED19
S14
S13
S16
stryker
COMMUNICATIONS
On/Off
2
LED 2..8
MIN
MAX
1
LED 10..16
Auto
Focus
White Balance
Iris
Zoom

LED Wall Control Panel

S1:	Light 2 ON/ OFF
S2:	Brightness Light 2 dark
S3:	Brightness Light 2 bright
S4:	Light 1 ON / OFF
S5:	Brightness Light 1 dark
S6:	Brightness Light 1 bright
S7:	Camera ON / OFF
S8:	Camera focus down (focus out)
S9:	Camera auto focus
S10:	Camera focus up (focus in)
S11:	White balance (color adjustment)
S12:	Camera iris down
S13:	Camera auto-iris
S14:	Camera iris up
S15:	Zoom out
S16:	Zoom in
LED1:	Light 2 defective
LED2..8:	Brightness indicator Light 2
LED9:	Light 1 defective
LED10..16:	Brightness indicator Light 1
LED17:	Auto focus ON
LED18:	White balance ON
LED19:	Auto iris ON

16.4 Plug Layout of the Electronic Control System

The location of the plug-in connections on the electronic control system is shown below.


Heat Sink
uC
ROM
PE
-Vin
+Vin
+Lamp
-Lamp1
-Lamp2
X1
X2
1
X4
1
Protective Ground
Common 24VDC
+24VDC
Common Lamp Line
Light One -
Light Two -
CAN + Connection
CAN Screen
CAN - Connection
N/A

WARNING **Follow ESD procedures to prevent damaging sensitive equipment.**

16.5 Plug Allocation

The following section describes the plug-in connections of the electronic control system.

Plug-in connection X3 to the power plug

Pin no.

- PE / protective grounding
- Supply voltage, negative
- Supply voltage, positive
- Joint lamp cable, positive, for lamps 1 + 2
- Negative lamp cable for lamp 1
- Negative lamp cable for lamp 2

Plug-in connection X2 to the CAN plug

Pin no.

- CAN + bus line
- CAN screen
- CAN - bus line

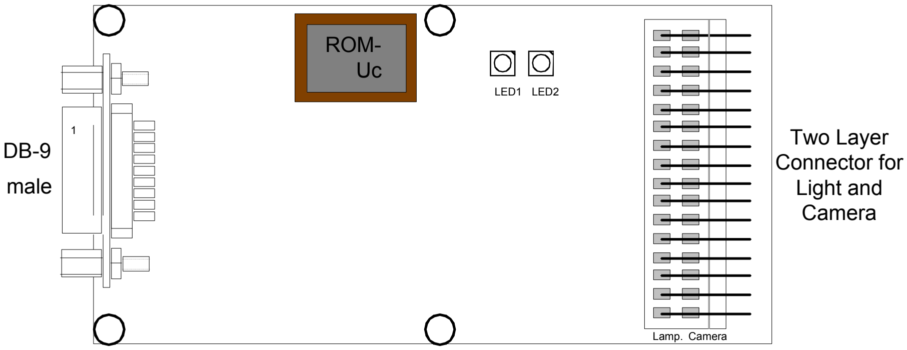
Plug-in connection X4 optional input or output

This connection is designed for an optional function and cannot be used at the moment.

Pin no.

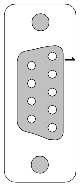
- High side output 24V
- GND high side
- Input GND active
- Input GND

16.5.1 Location of the Plug and Diagnostic LEDs on the Terminal


ROM-
Uc
LED1
LED2
1
DB-9
male
Two Layer Connector for Light and Camera
Lamp.
Camera

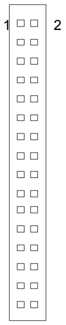
16.5.2 Plug Allocation Operating Console and Diagnostic LEDs

SUB-D
9-pole
male



Pin 1: + 24V)
Pin 2: RxD
Pin 3: TxD
Pin 4: Not Connected
Pin 5: GND (System)
Pin 6: + 24V)
Pin 7: CAN low
Pin 8: CAN high
Pin 9: GND (System)
Case: Sheild CAN-Bus

2- row male
multipoint
connector for
connection of
light and
camera



Camera	Light 2	Light 1 Without Camera!
Pin2: Inlet Trace 7..17 (GND)	Pin1: GND for Trace 4..6	Pin1: GND Trace 1..3
Pin4: Common for LED17..19	Pin3: VCC LED9..16	Pin3: VCC LED1..8
Pin6: Cathode LED19	Pin5: VCC LED9..16	Pin5: VCC LED1..8
Pin8: Cathode LED18	Pin7: Cathode LED9	Pin7: Cathode LED1
Pin10: Cathode LED17	Pin9: Cathode LED16	Pin9: Cathode LED8
Pin12: Feedback Trace 13	Pin11: Cathode LED15	Pin11: Cathode LED7
Pin14: Feedback Trace10	Pin13: Cathode LED14	Pin13: Cathode LED6
Pin16: Feedback Trace 9	Pin15: Cathode LED13	Pin15: Cathode LED5
Pin18: Feedback Trace 8	Pin17: Cathode LED12	Pin17: Cathode LED4
Pin20: Feedback Trace12	Pin19: Cathode LED11	Pin19: Cathode LED3
Pin22: Feedback Trace 11	Pin21: Cathode LED10	Pin21: Cathode LED2
Pin24: Feedback Trace 7	Pin23: Feedback Trace6	Pin23: Feedback Trace3
Pin26: Feedback Trace 15	Pin25: Feedback Trace5	Pin25: Feedback Trace2
Pin28: Feedback Trace 16	Pin27: Feedback Trace4	Pin27: Feedback Trace1
Pin30: Feedback Trace 14	Pin29: Feedback Trace (Reserve)	Pin29: Feedback Trace (Reserve)
Pin32: VCC (not connected)	Pin31: Feedback Trace (Reserve)	Pin31: Feedback Trace (Reserve)

LED1: blinks rapidly (visible blinking): Micro-controller is in main routine.
LED2: blinks with approx. 1 Hz: CAN communication with electric control system is OK.
blinks with approx. 3 Hz: CAN communication with electronic control system is not OK (will only by analyzed after Power Up).

LED1

Blinks rapidly (visible blinking): Micro-controller is in main routine.

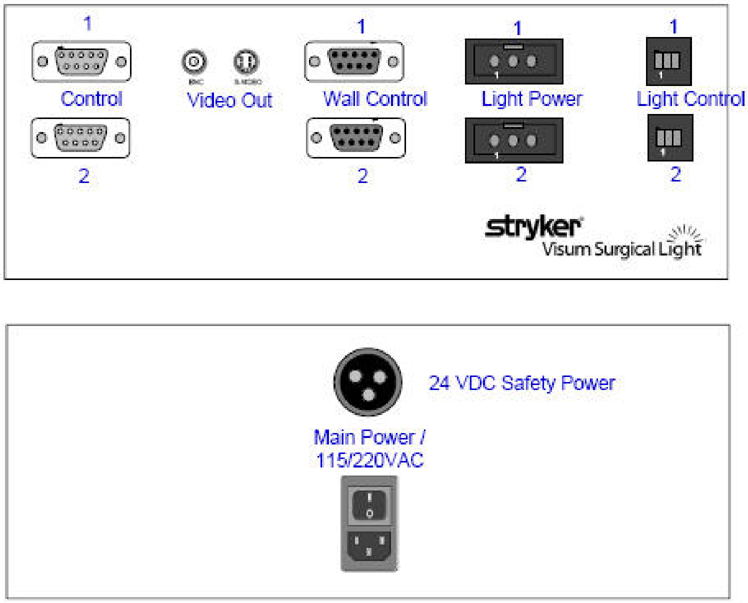
LED2

Blinks with approx. 1 Hz: CAN communication with electronic control system is OK. Blinks with approx. 3 Hz: CAN communication with electronic control system is not OK (will only be analyzed after Power Up).

16.5.3 Plug Locations of the Power Box

The positions of the plug-in connections of the power box are described below.

Upper row, No. 1 connects light system 1, which is the upper light on the support arm. The lower row, No. 2 connects the lower system to the support arm accordingly.


1
Control
2
Video Out
1
Wall Control
2
1
Light Power
2
1
Light Control
2
stryker
Visum Surgical Light
24 VDC Safety Power
Main Power /
115/220VAC

Plug Allocation Power Box

16.5.4 Connections at the front:

Plug-in connection light control for lights 1 + 2

Pin No.

1. CAN -
2. CAN screen
3. CAN +

Plug-in connection light power for lights 1 + 2

Pin No.

1. Supply lights -
2. PE / protective grounding
3. Supply lights +

Plug-in connection wall control for lights 1 + 2

Pin No.

1. Supply terminal +
2. RS-232, RXD
3. RS-232, TXD
4. Not Connected / Reserved
5. Supply GND
6. Supply terminal +

7. CAN -
8. CAN +
9. Supply GND

Plug-in connection Control for lights 1 + 2

Pin No.

1. Not Connected
2. RS-232, RXD
3. RS-232, TXD
4. Not Connected
5. Supply GND
6. Not Connected
7. Not Connected
8. Not Connected
9. Not Connected

Plug-in BNC connector video

Pin No.

1. Video signal 1VPP at 75 ohm
2. Video GND

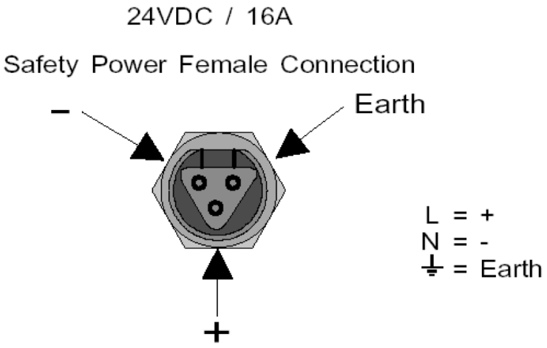
Plug-in connection S video

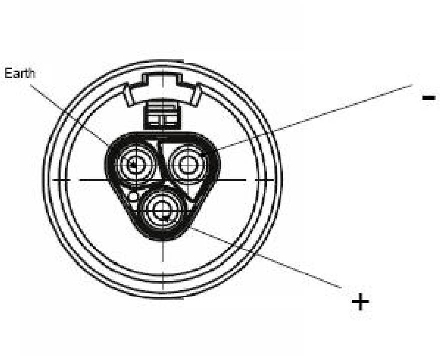
Pin No.

1. Luminance signal
2. Chrominance
3. Luminance GND
4. Chrominance GND

16.5.5 Connections at the back:

- Mains power is connected by a standard IEC connector.
- Safety Power is connected via a 24VDC power connector.

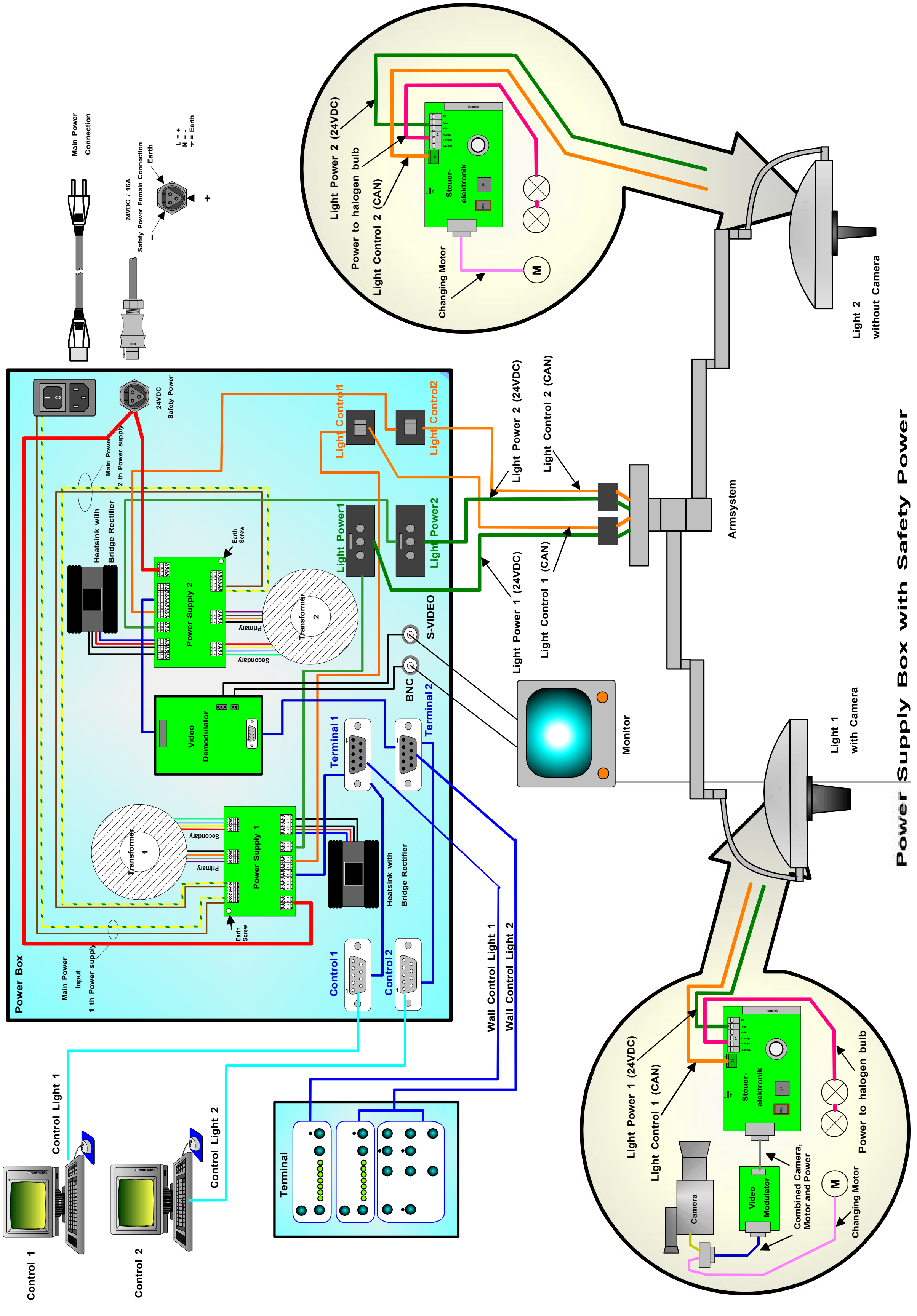

24VDC / 16A
Safety Power Female Connection
–
Earth
+
L = +
N = -
⏚ = Earth



Front View of Connector

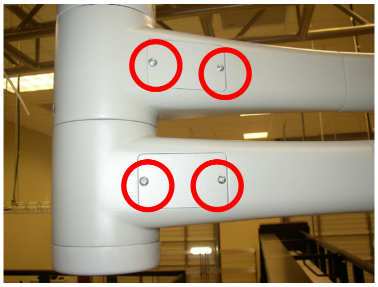
16.5.6 Connection Structure of Systems

The wiring for the whole system is shown below.

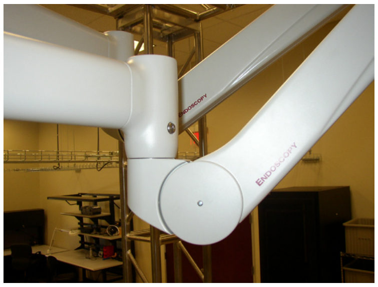

Power Supply Box with Safety Power
Power Box
Main Power Input
1 th Power supply
Main Power
2 th Power supply
24VDC Safety Power
Main Power Connection
24VDC / 16A Safety Power Female Connection
Earth
L = +
N = -
⏚ = Earth
Heatsink with Bridge Rectifier
Power Supply 1
Power Supply 2
Transformer 1
Transformer 2
Primary
Secondary
Earth Screw
Video Demodulator
Light Control1
Light Control2
Light Power1
Light Power2
S-VIDEO
BNC
Terminal 1
Terminal 2
Control 1
Control 2
Wall Control Light 1
Wall Control Light 2
Terminal
Control Light 1
Control Light 2
Control 1
Control 2
Monitor
Armsystem
Light Power 1 (24VDC)
Light Control 1 (CAN)
Light Power 2 (24VDC)
Light Control 2 (CAN)
Light 1 with Camera
Light 2 without Camera
Power to halogen bulb
Changing Motor
Steuer-elektronik
M
Camera
Video Modulator
Combined Camera, Motor and Power

Description of Control Board	**Stryker Visum Electronic Control System**	**Stryker Visum Wall Control**
Micro-controller	Siemens SAF- C515 - C	Siemens SAF- C515 - C
Clock rate	8 MHz	8 MHz
Program memory	EPROM , capacity 256 Kbit to 1 Mbit	Flash EPROM, capacity 256 Kbit to 1 Mbit
Parameter memory	EEPROM, capacity 1 KB	N/A
Supply voltage	16 .. 40 VDC ripple max.10%	16 .. 40 VDC +- 10%
Power consumption in a typical operating situation without external components	7 Watt at 40 VDC supply	1 W at 24 V
Current in the light branch	max. 16 A	-
Optional output High side	24V max. 100mA short circuit proof	-
Optional input	24V pulling against mass	-
Overlap time in case of power failure	min. 500 ms	-
Printed circuit board	100mm X 160mm 4 - layers multilayer	45mm X 90mm 4 - layers multilayer
Operating temperature (T_A)	0 .. 85°C	0 .. 70°C
Storage temperature	-40°C .. + 85°C	-40°C .. + 85°C
Relative humidity	Max. 95% at 25˚ C, no exposure to moisture	Max. 95% at 25°C, no exposure to moisture
EMC inspection for control and operating console		
Interference emission	EN 55011 / 3.91 or	N/A
Interference emission	EN 55011 / 3.91 or EN 55022 / 8.94 EN 50081-1 / 1.92	N/A
Interference immunity	EN 50082-2 / 3.95 Supply 2KV	N/A

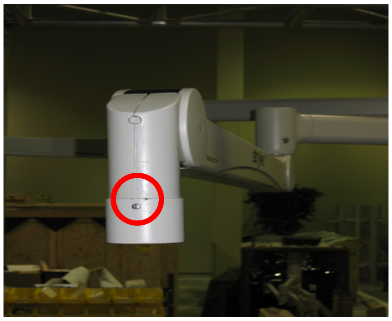
Acrobat 2000



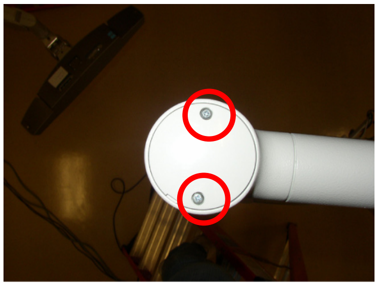
Location: Base of Arm
Generic Name: M4 X 6 Phillips
OHMS



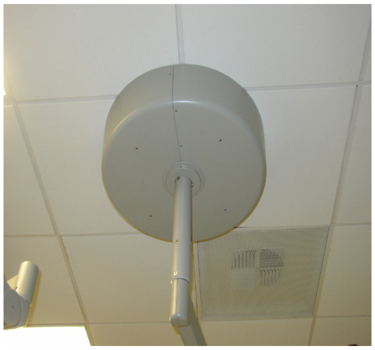
Location: Cover
Generic Name: M3 X 8 Phillips
OHMS



Location: Attachment Housing
Generic Name: M3 X 6 Phillips
OHMS



Location: Elbow
Generic Name: M3 X 40 Phillips
PHMS

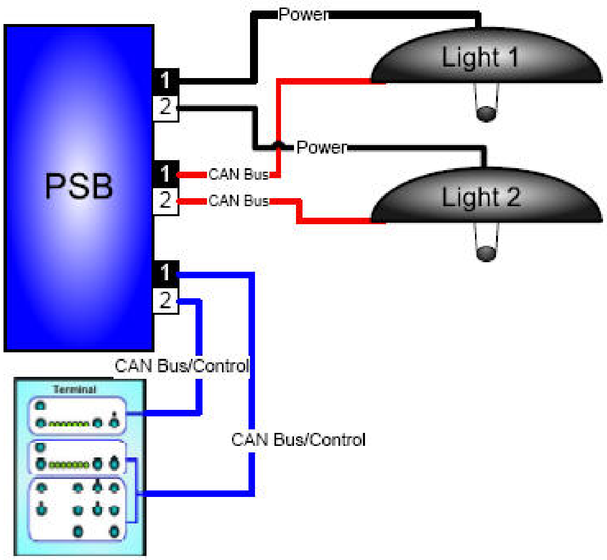


Location: Ceiling Cover (Single
Booms and Lights)
Generic Name: (#6 X 0.5 inch Oval
Head Sheet Metal Screw)

16.6 Can Bus Troubleshooting

Caution Follow ESD prevention procedures.

16.6.1 Light Block Diagram

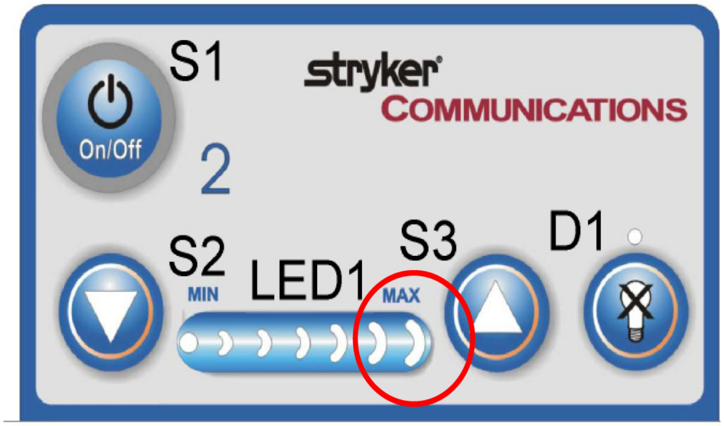


Troubleshooting the light is simplified because there are two completely independent systems. The best method for testing is to look at the symptoms and swap cables to narrow down the problem. Here are steps to try:

1. Swap Power Cables – check if problem is in light head or power supply box.
2. Swap CAN Control Cables – check if problem is in control wiring
3. Swap Touch Panel Cables – check if problem is in Touch Panel or wiring between power supply box and Touch Panel

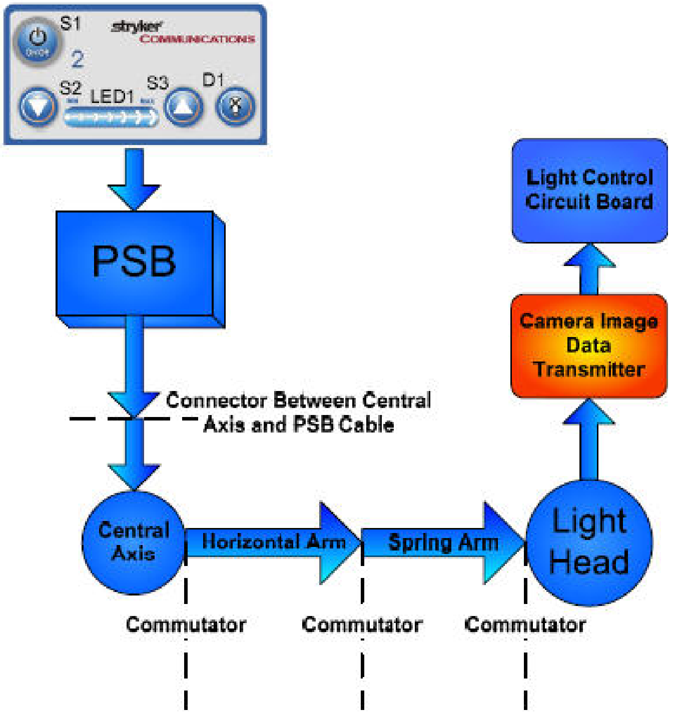
Visum Lighting uses CAN bus technology to control the light and In-Light Camera. CAN bus is a serial digital protocol similar to RS-232. It is carried differentially over twisted pair wiring. In our application it is actually carried over two coaxial cables using the two center conductors.

The shields are used but grounded at different points through the signal path and DO NOT make a continuous electrical path from the power supply box to the Light Control Circuit Board. Most control problems are due to a broken CAN Bus connection. This will be evident by the last LED on the Light Control Touch Panel blinking.



To troubleshoot this issue take off the cover of the light head and perform continuity checks from the light head back to the power supply box.

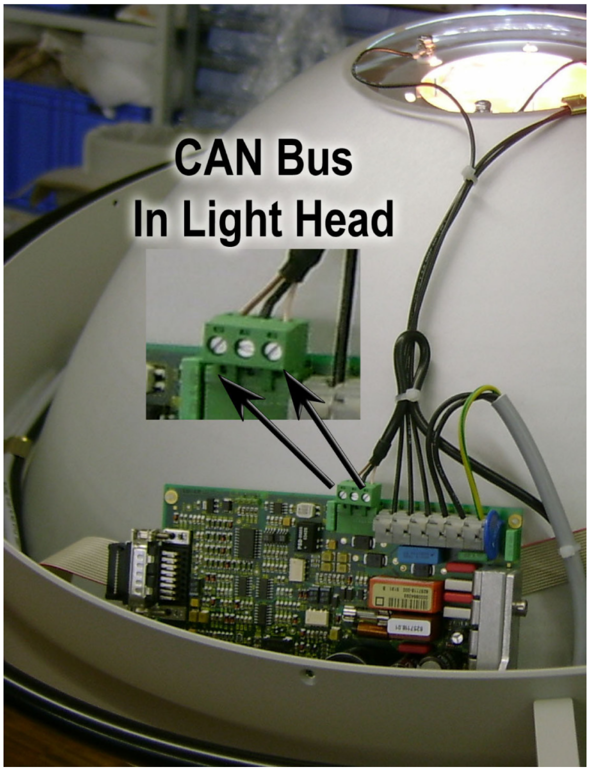
The CAN+ is on the brown coaxial center conductor and the CAN – is on the clear center conductor.


S1
stryker COMMUNICATIONS
2
S2
LED1
S3
D1
PSB
Connector Between Central Axis and PSB Cable
Light Control Circuit Board
Camera Image Data Transmitter
Central Axis
Horizontal Arm
Spring Arm
Light Head
Commutator
Commutator
Commutator

1. Check directly from the light head to the power supply box. If there is an open in either of the CAN bus lines, half split to find the broken connection.
2. Check the cable at the Central Axis connection.
3. If the connection is broken between the Central Axis and the power supply box then the problem is CAN bus Cable. If the problem is between the Central Axis and the light head, half split further and check the Horizontal Arm connector at the Central Axis commutator.
4. Continue down the arm to the Spring Arm.

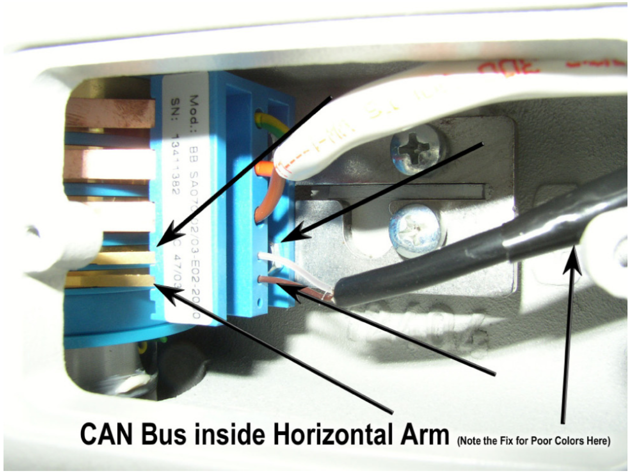
When you find the break, either repair it or replace the defective component.

Note It is possible that a reverse wiring in the CAN bus occurred. Check this by toning or continuity checking the Brown at the power supply box to the Clear at the light head.


CAN Bus
In Light Head

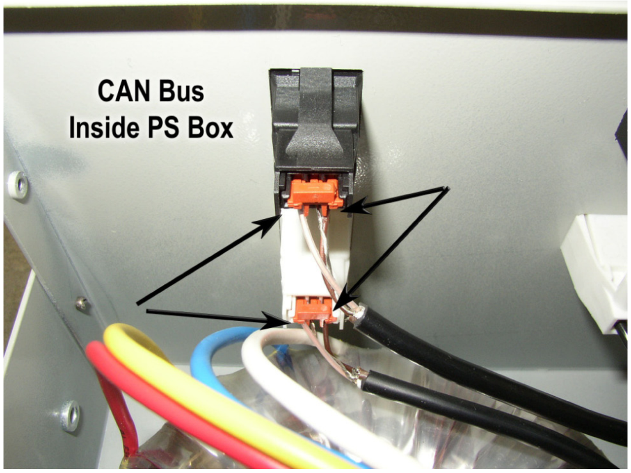
CAN BUS Connection in the Light Head
The brown wire is CAN+ and the Clear is CAN-.

Note If there is an Image Data Transmitter board installed, the CAN bus connects to it first, then to the Light Circuit Board.

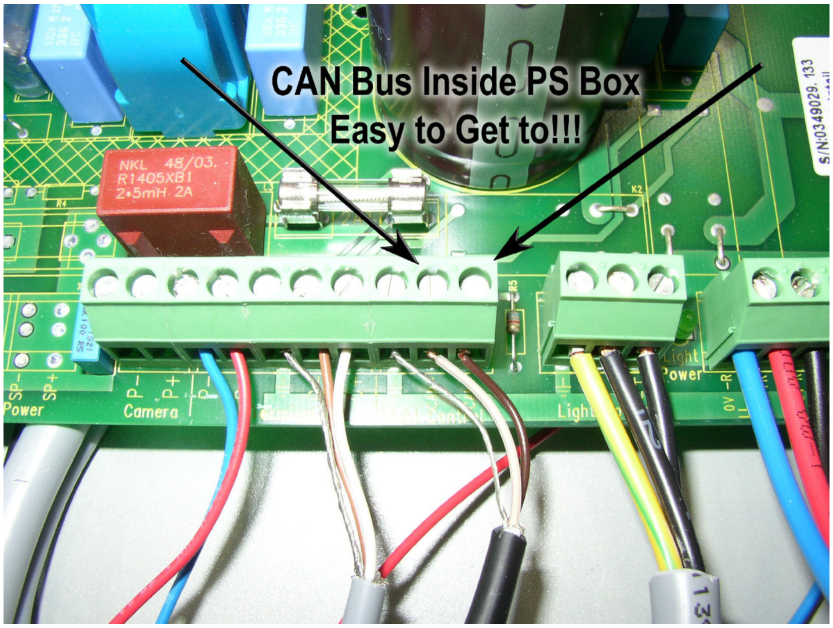

CAN Bus inside Horizontal Arm (Note the Fix for Poor Colors Here)

CAN Bus connection in the Horizontal Arm
The brown wire is CAN+ and the clear wire is CAN-.

Note To gain access to these wires, remove the small cover next to the Central Axis. The Central Axis rework for proper transmission of color from the in-light Camera is visible by electrical tape as shown in the picture.


CAN Bus
Inside PS Box

CAN Bus connection in the power supply box just inside the panel connector
The brown wire is CAN+ and the clear wire is CAN-.
To access these wires, remove the top cover from the power supply box.


CAN Bus Inside PS Box
Easy to Get to!!!
NKL 48/03.
R1405XB1
2•5mH 2A
SP-
SP+
Power
P-
P+
Camera
Light
Power
S/N:0349029.133

CAN Bus connection in the power supply box on the internal circuit board
The brown wire is CAN+ and the clear wire is CAN-.
To gain access to this area, remove the small cover from the power supply box
and look at the circuit board.

17. Servicing Booms

17.1 System operation

The Stryker EDS Boom System uses an electrical pneumatic braking system. The system is intended to act as a friction brake, holding the boom in position after desired movement. The brakes require a source of compressed air to function. For proper operation the regulator should be set to 80 ±5.0 PSI.

⚠ **Caution** **To avoid potential damage to the brake bladder, do not set the pressure above 80 ±5.0 PSI.**

Pressure is supplied to the brake bladders to engage the brakes. To release the brakes, an air valve is pressed, which vents the brake bladder to the atmosphere. The bladder then collapses and releases the brake.

The system consists of the following components:

- A pressure regulator supplied with the boom pre-install kit.
- 5/32 inch (4mm) plastic tubing between the various components.
- Two push buttons - one for the upper brake, one for the lower brake (and service head for articulating systems), both mounted on one of the shelves on the Boom Service Head. In some systems, there may be a second set of controls on the back of the Service Head.

☞ **Note** For Legacy systems, the push buttons are air valves.

- Two brake bladders for non-articulating systems. Three brake bladders for articulating systems.
- A Tee fitting to split the supply line into both air valves.
- For Booms that have StrykeVac, an additional Tee is used to supply air to the StrykeVac.

All components feature quick disconnect style fittings.

To remove a tube:

- Press inward and evenly around the fitting of the tube and pull it out.
  Minimal force is required on the tubing.

⚠ **Caution** **It is recommended to turn off the air for the braking system prior to disconnecting the plastic tubing.**

☞ **Note** Damage to the fitting or tube can occur if you pull too hard on the tubing. When replacing or reconnecting tubing, the end of the tubing must be cut flush and perpendicular to the tubing.

See the next page for a pictures of the system.

17.2 Troubleshooting

There are two main categories of problems:

- Air leaks
- Air supply issues

Refer to the Stryker Documentation System for the most accurate schematics:

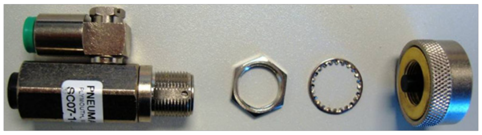
- Brake Hose wiring – DHD10609 PNEUMATIC SCHEMATIC, BOOMS WITH ELECTRO-PNEUMATIC CONTROL MODULE, 0557
- MMP200 motor wiring – DHD10582 WIRING SCHEMATIC, PNEUMATIC CONTROLLER, MMP200, SH2.
- MMP200 motor wiring w/ E-Stop – DHD10583 WIRING SCHEMATIC, E-STOP, MMP200, SH2

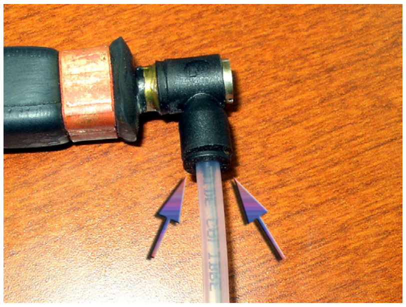
17.2.1 Air Leaks

Identify the source of the leak to the component. This can usually be done by listening for air. It may help to lower the regulator pressure. If the Brake regulator inlet leaks the first time it is pressurized, it may have been damaged when the contractor installed the inlet pipe.

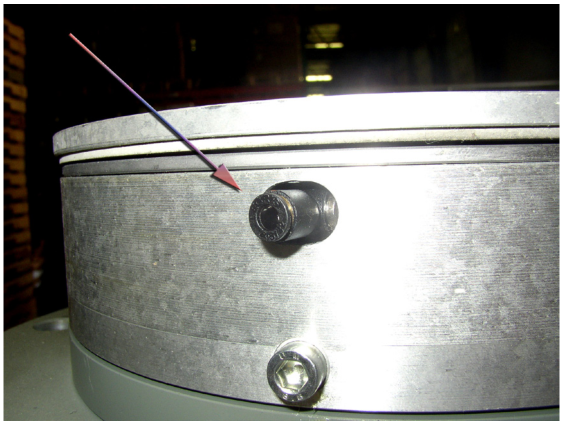
> ⚠ **Caution** **To adjust the air supply regulator you must pull out on the regulator handle to unlock it prior to rotating. Clockwise rotation reduces pressure and counterclockwise rotation increases pressure.**

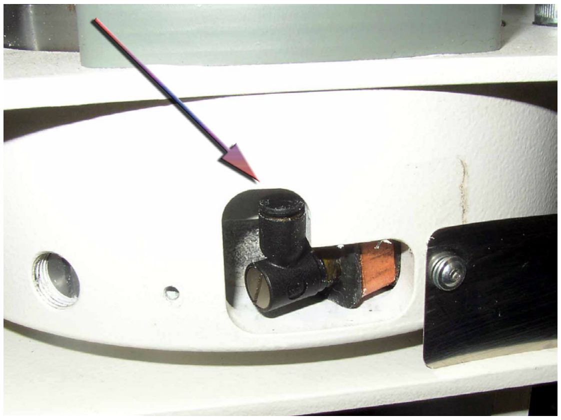
The following pictures show the various connection points:





Air release valve showing connections Brake bladder with hose connected

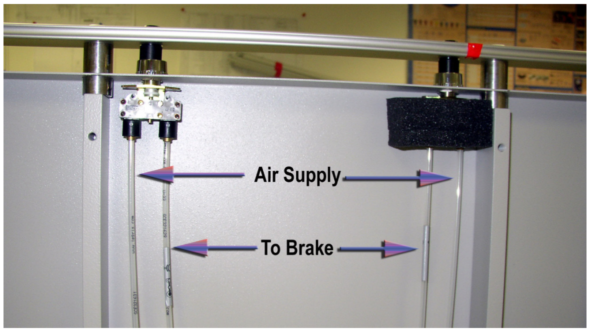




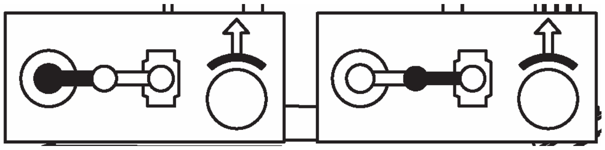
Upper connection point (above ceiling) Lower connection point behind small cover

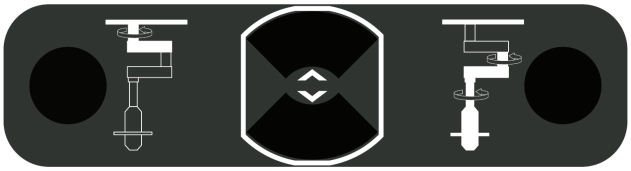
These are the actual hose connection points. To access the lower arm you must remove the arm covers and the end caps for the upper arm.

Note The mounting of the air valves on the shelf has one valve reversed. This causes both outside lines to be supply lines and the inner lines to be bladder connections. The foam around the valves is for noise reduction while venting.


Air Supply
To Brake

Foam removed from Left Air Valve for illustration purposes.





The symbols above are used to identify each brake. The Left hand symbol refers to the upper brake. The symbol on the right indicates the lower brake. These are used to label the air valves and the tubing.

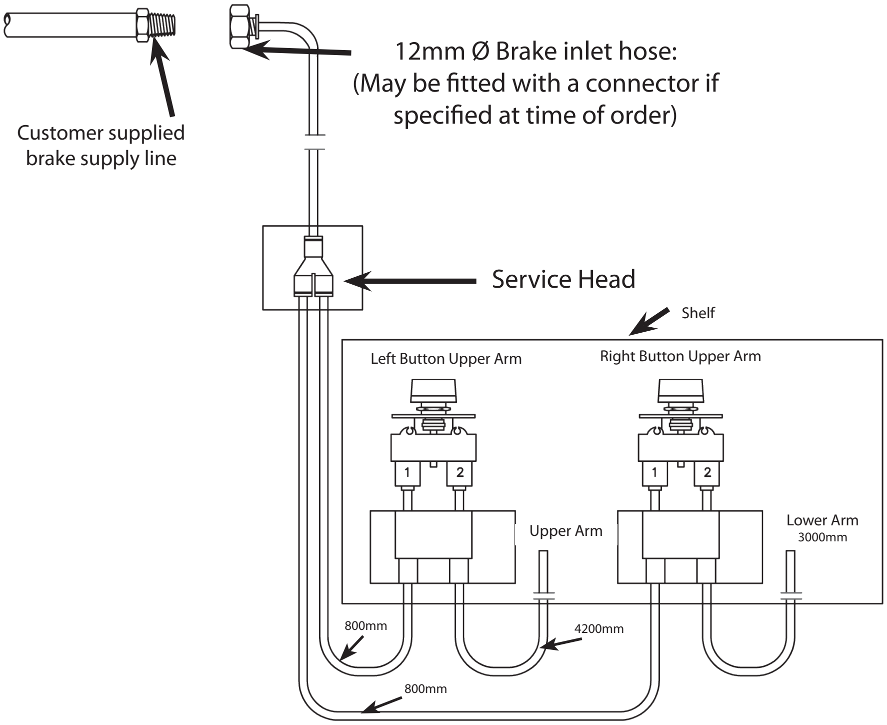

12mm Ø Brake inlet hose:
(May be fitted with a connector if specified at time of order)
Customer supplied brake supply line
Service Head
Shelf
Left Button Upper Arm
Right Button Upper Arm
1
2
1
2
Upper Arm
Lower Arm
3000mm
800mm
4200mm
800mm

Diagram of Brake System for Stryker Articulating Equipment Booms for Legacy Systems

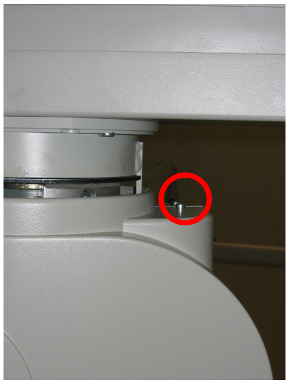
17.3 Miscellaneous Hardware Parts List

Legend:

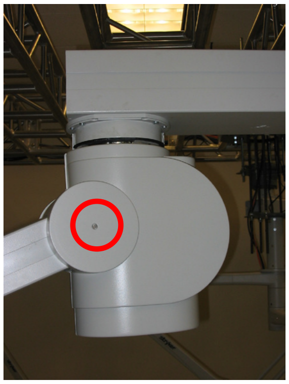
- SHCS - Socket Head Cap Screw
- OHMS - Oval Head Machine Screw
- PHMS - Pan Head Machine Screw

All screws should be stainless-steel.

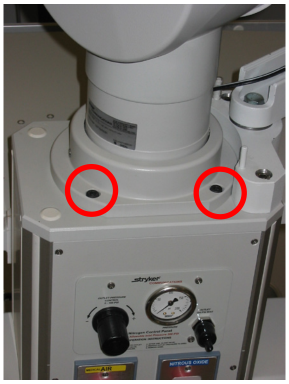
OMS-200



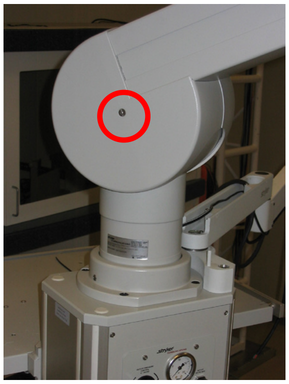
Location: Elbow Cover (Top)
Generic Name: M6 X 12 Phillips OHMS



Location: Elbow Cover (Side)
Generic Name: M6 X 12 Phillips (OHMS)

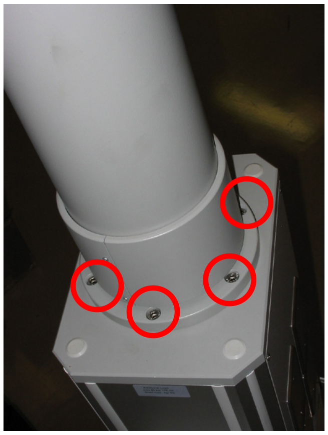


Top of Service Head
M8 X 25 Low Head SHCS and Serrated Washer

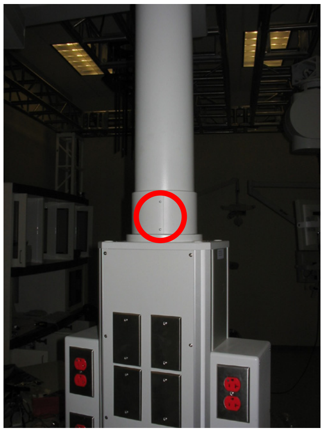


Knuckle Cover
M6 X 12 Phillips OHMS

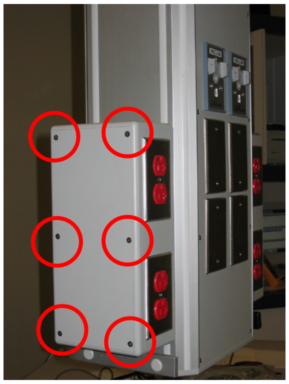
OndaScope Variant



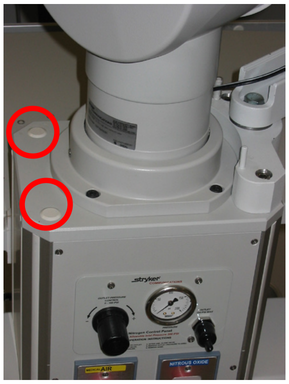
M8 X 30 Low Head SHCS and Serrated Washer



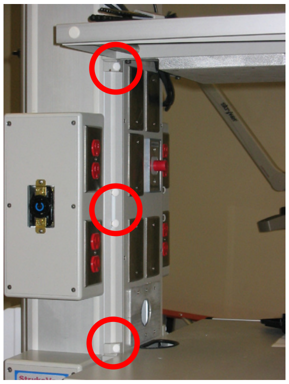
#4 X 0.25 inch Pan Head Sheet Metal Screw
M4 X 14 Phillips PHMS



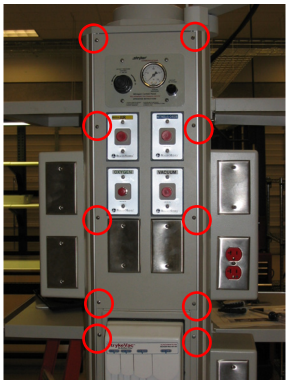
Location: Module Box
Generic Name: #8-18 X 5/in OHMS



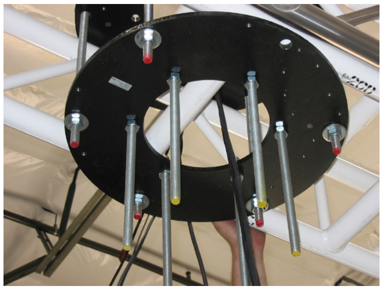
Location: Top of Service head
Generic Name: Plastic Cap; Screw: M10 X X 30 Low Head SHCS



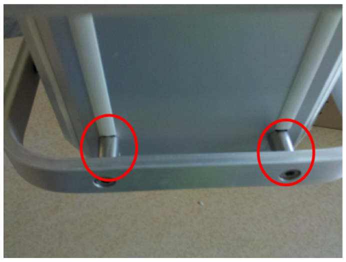
Location: Shelves
Generic Name:
Screw: M6 X 16 SHCS; Plastic Cap:
Washer: Serrated Belleville for M6 Screw



Location: Front and Rear Service Head Panels
Generic Name: M4 X 10 Phillips OHMS

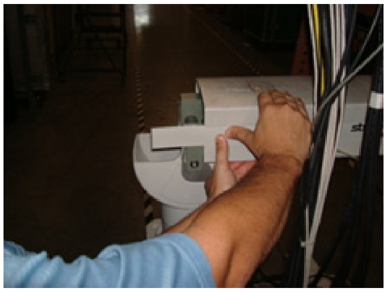


Location: Mounting (Interface) Plate
Generic Name: M16 Hex Nuts, flat washers, and standard lock washers.



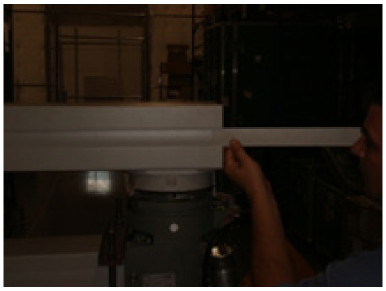
Location: Service Head
Generic Name: Spacer, Fairfield Spacer

17.4 Replacing the Trim Strip

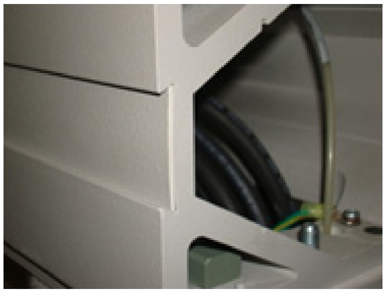


1. Slide the strip with your thumbs so the strip extends from boom arm.

2. Pull strip out.



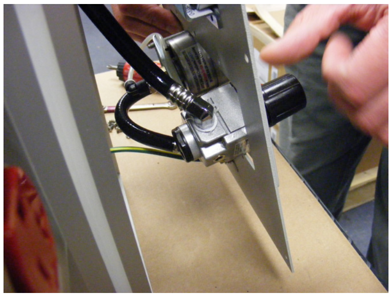
3. Insert strip in channel on boom arm.



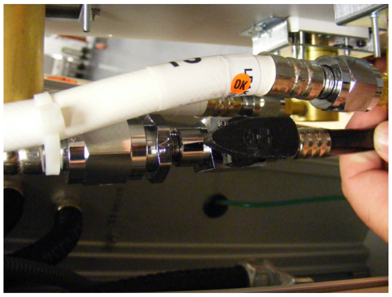
4. Slide strip in channel on boom and make sure strip is flush in channel.

17.5 Replacing Med Gas

17.5.1 Replacing a Nitrogen Regulator

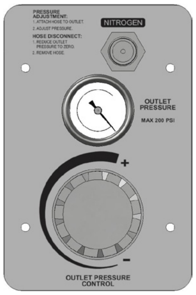


1. Turn off main nitrogen supply to the OR and disconnect.
2. Remove Service Head panel.



3. Remove the black nitrogen hose on the regulator.

stryker
COMMUNICATIONS
Nitrogen Control Panel
AMICO


PRESSURE ADJUSTMENT:
1. ATTACH HOSE TO OUTLET.
2. ADJUST PRESSURE.
HOSE DISCONNECT:
1. REDUCE OUTLET PRESSURE TO ZERO.
2. REMOVE HOSE.
NITROGEN
OUTLET PRESSURE
MAX 200 PSI
+
-
OUTLET PRESSURE CONTROL

4. Remove the four Phillips head screws and washers that attach the regulator to the service head.

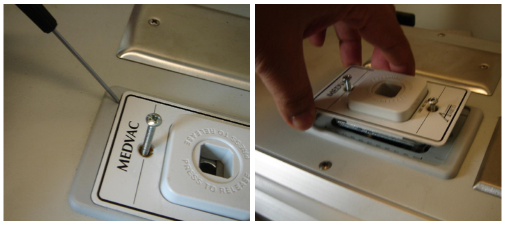
5. Replace the regulator and attach it to the Service Head back panel.
6. Connect the nitrogen hose regulator.
7. Attach the back panel to the Service Head.
8. Turn on the main nitrogen supply to the OR and set the pressure to 160 psi.
9. Request that the hospital recertify the nitrogen system for leaks.

17.5.2 Replacing Med Gas Plate

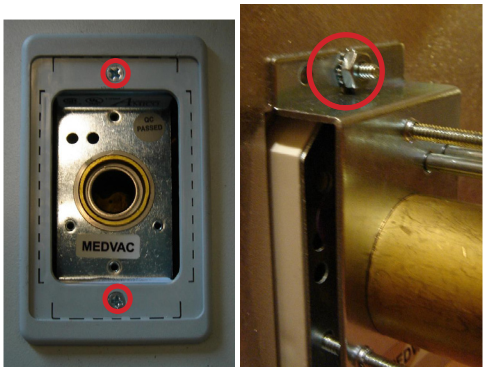
MEDVAC
USE NO OIL
AMICO

MEDVAC
PRESS TO RELEASE
USE NO OIL
AMICO

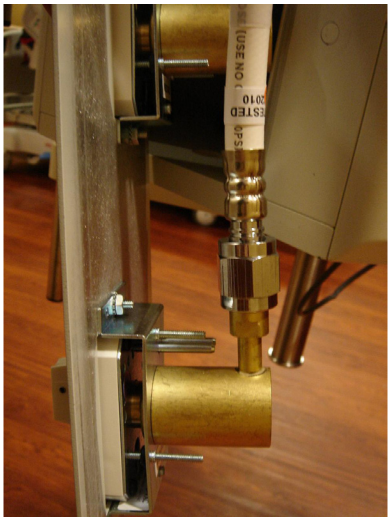
1. Shut off the respective gas, if it has not already been done.
2. Remove the screws attaching the gas plate to the back body. The screws will have a captive band on the opposing side, so it does not have to be completely removed.



3. Using a thin, flat head screwdriver, carefully pry the gas plate away from the plastic frame and back body.



4. With the gas plate removed, you will see two additional screws holding the back body onto the service head face plate. Remove these screws by holding onto the nut in the back. Save these for re-installation.

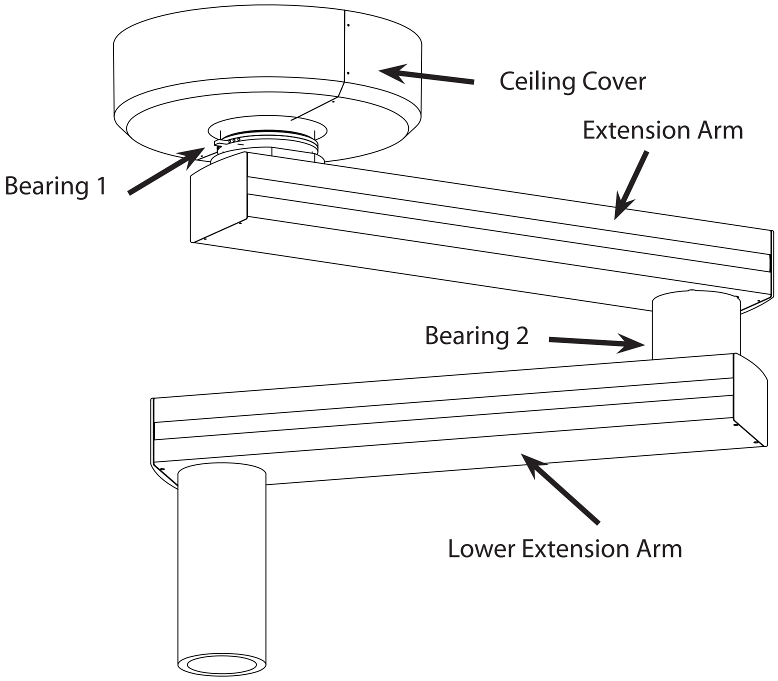


5. With a crescent wrench, remove the gas hose from the back body.
6. Replace (pull) new gas hose.
7. Connect the [new] gas hose to the [new] gas back body.
8. Tighten the gas hose onto the corresponding back body until hand tight. Continue tightening with a wrench for an additional ¼ turn. Tightening any further may cause damage to the fitting and result in a gas leak.
9. Attach the back body to the service head face plate by inserting and tightening the respective screws.
10. Insert the gas plate into the back body and tighten with the two screws.

Note It is at the discretion of the hospital to determine whether they will need to recertify the new gas assembly.

17.6 Replacing the Brake Bladder

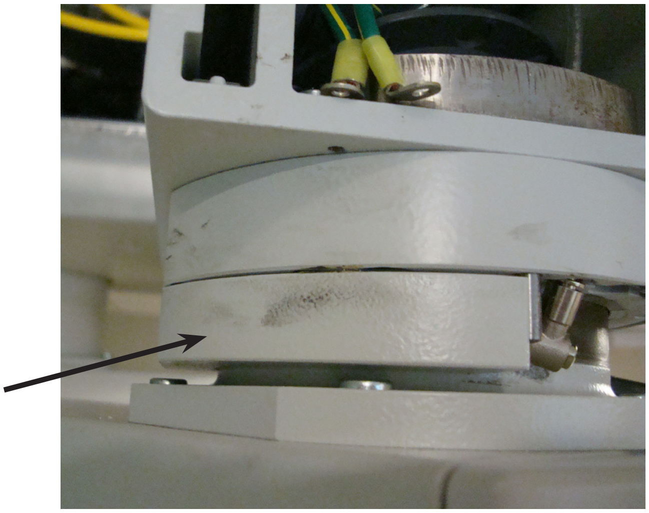
This section applies to replacing the Bearing 2 brake bladder and plastic protective collar in an OSC400 Non-Articulating boom.


Ceiling Cover
Extension Arm
Bearing 1
Bearing 2
Lower Extension Arm

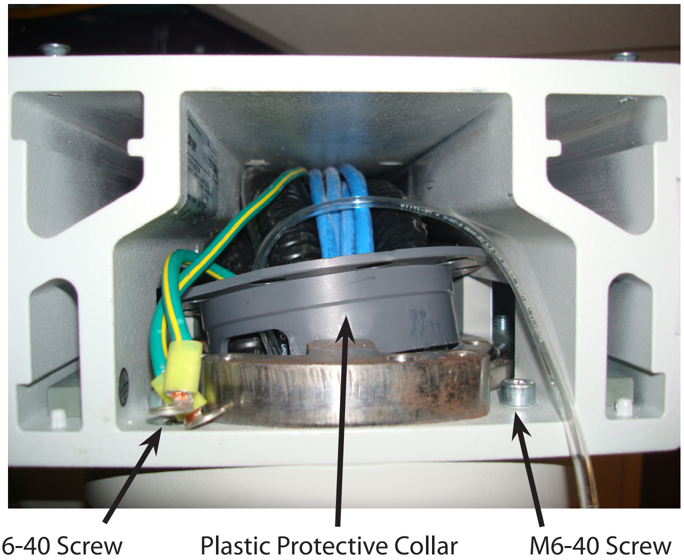
Boom Configuration

Note If possible, have the account shut off the nitrogen supply to the brakes. If this is not possible, release the brake line pressure by isolating the gas to the individual boom to be serviced. Then press the brake buttons until all gas has been released.

Note Please ensure to keep all removed hardware in a safe location, since it will be used again to assemble the components.

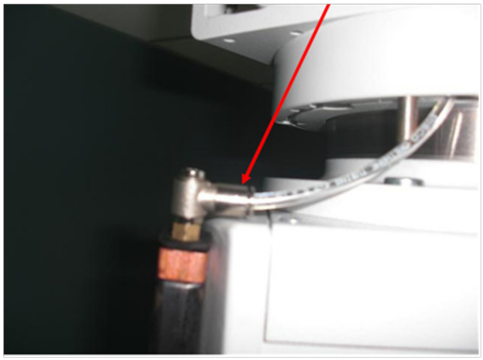


Brake Bladder Raceway with Half of Raceway Removed



1. Remove the upper extension arm end cap by following the instructions in the End Cap Installation section of this manual.
2. Remove the two M6-40 screws located in front of the bearing using a 5mm metric Allen wrench.
3. Depending on the age of the arm set, there may be access holes located on the top of the arm set. If there are access holes, remove the rubber plugs using pliers or a flat head screwdriver.
4. Using a 5mm long handle ball-end Allen screwdriver, completely loosen but do not remove the other two M6-40 screws located at the rear of the bearing by inserting the Allen screwdriver through the access holes and engaging the screws. To access these screws, the screwdriver will need to be inserted at an angle.
5. If the access holes are not present, reach through the opening of the upper arm with an Allen wrench to engage the wrench with the screws. The screws are located on the backside on each side of the bearing.

Note These two screws are typically hard to locate since the boom is filled with hoses, conduit, etc. Take extra care when removing these screws. Only unthread screws to a point where the raceway is no longer engaged to these screws. DO NOT remove the screws from their housing, otherwise retrieval of these screws can become difficult.



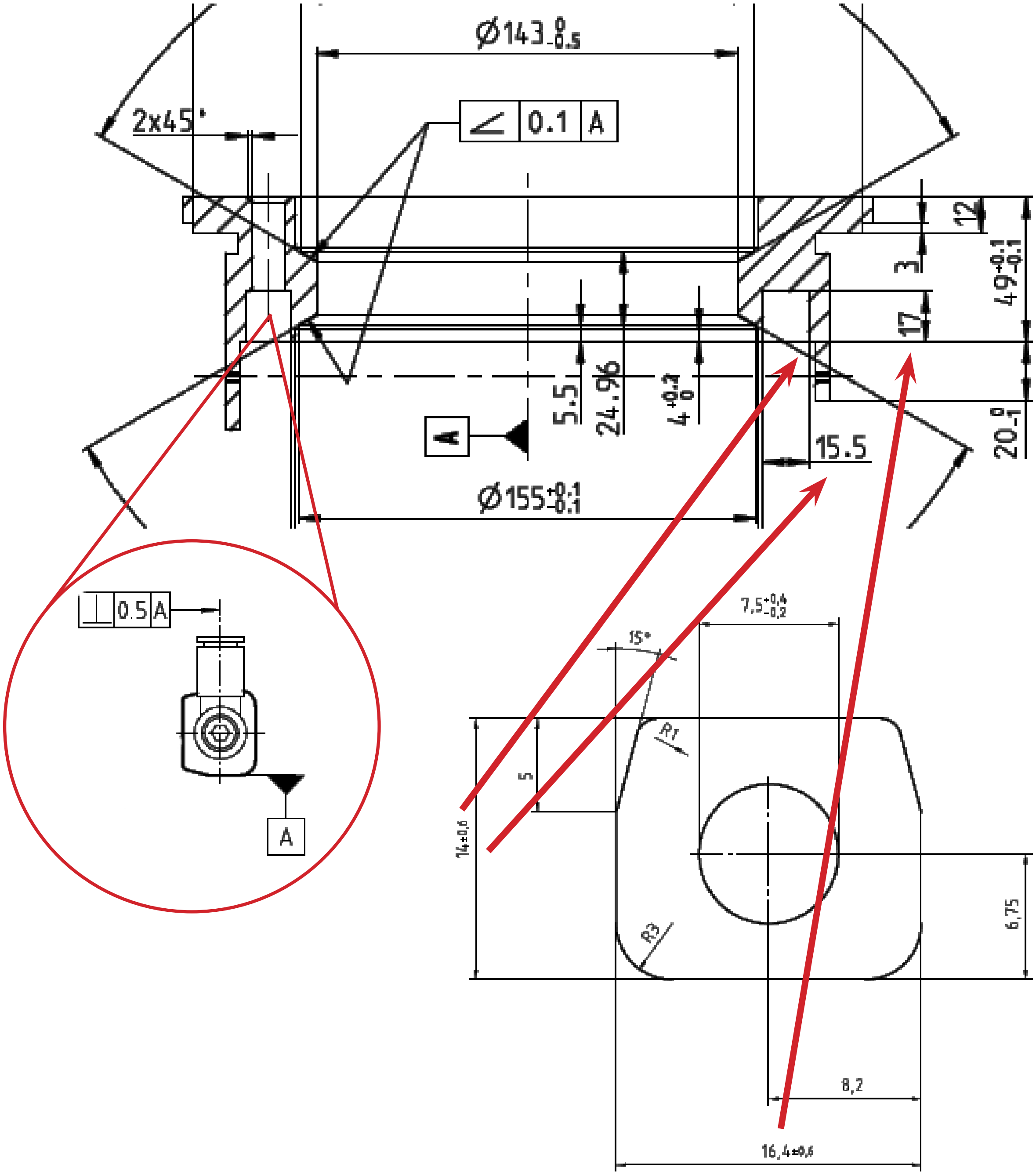
6. Once the two front M6-40 screws have been removed and the rear two M6-40 screws have been completely loosened, the raceway should be free to remove. A small flat head screwdriver may be needed to gently lift the rear M6-40 screws to allow the raceway to become free. The raceway consists of two halves. Place the two halves in a safe place for later reassembly.
7. With the raceway removed, remove the brake bladder by depressing the quick-connect fitting while pulling the brake line.
8. With the brake line removed, the bladder can now be inspected/replaced.

To replace the brake bladder, do the following:

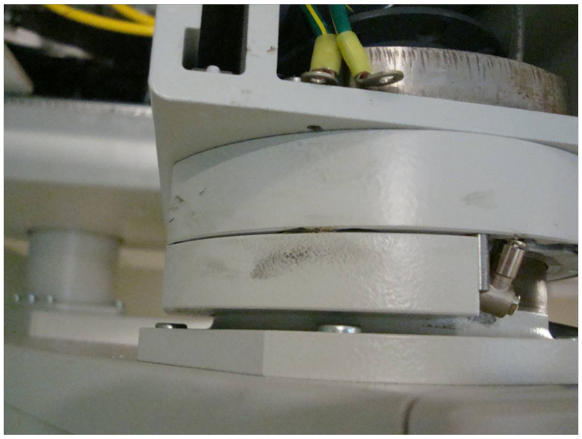
1. Insert brake line back into quick-connect fitting on brake bladder

> **Note** Ensure brake line is inserted fully into fitting and that hose has a 90° edge and not a hose that has been cut at an angle.

2. Ensure bladder is fitted around bearing in proper orientation. Using the diagrams below, route the bladder with the shorter flat edge against the bearing surface and the 14mm side up.


Ø143-0.5
2x45°
0.1 A
12
3
49±0.1
17
20-1
5.5
24.96
4+0.2
A
15.5
Ø155±0.1
0.5 A
A
7,5+0,4-0,2
15°
R1
5
14±0,6
R3
6,75
8,2
16,4±0,6

Schematics of Bladder Installation at Bearing 2 Raceway

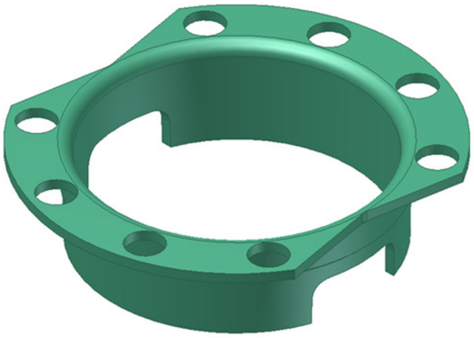


3. While wrapping bladder around bearing, place bladder fitting into hole where brake line is protruding.
4. With brake bladder wrapped around bearing, place half of the raceway back into position with bladder housed in raceway.
    - Using a small flat blade screwdriver, slightly lift the rear M6-40 screw so that the raceway can fit back into its specified location
5. Align threaded holes on raceway with holes from screws.

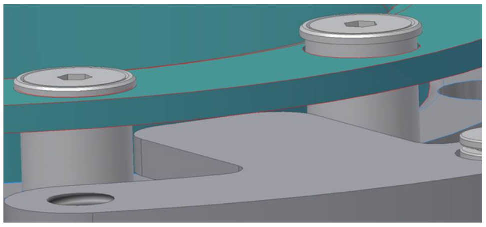
Note DO NOT remove the screw from its housing, otherwise retrieval of this screw can become difficult.

6. Tighten M6-40 screws without stripping head
7. Repeat steps outlined above for the other half of the raceway.
8. Replace upper extension arm access hole plugs (if applicable) by inserting into location.
9. Turn supply brake line gas back on pressurizing boom to 75 ± 5 psi and run through functionality of brakes to ensure no audible leaks can be heard.
10. Replace end cap cover by following steps outlined in 1004-400-061

To replace the Protective Collar, do the following:



1. Remove the upper extension arm end cap by following instructions from 1004-400-061, EDS Installation and Service Manual.
2. Remove the two M5-25 screws that hold the collar in place.
3. Back pull cables, conduit, etc. in order to remove the collar.

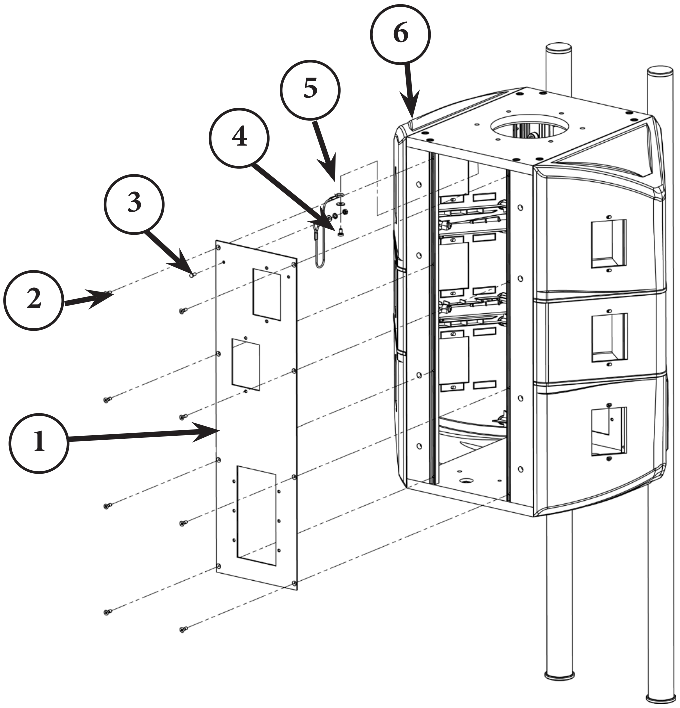


4. Install collar into designated location housed within bearing.
5. Re-install the two M5-25 screws in their designated location.
6. Pull the cables, conduit, etc. back through the boom.

17.7 Reassembling the Service Head

Caution **Power should be cut from the boom system prior to removing any modules.**

17.7.1 Removing and Attaching the Front and Back Plates



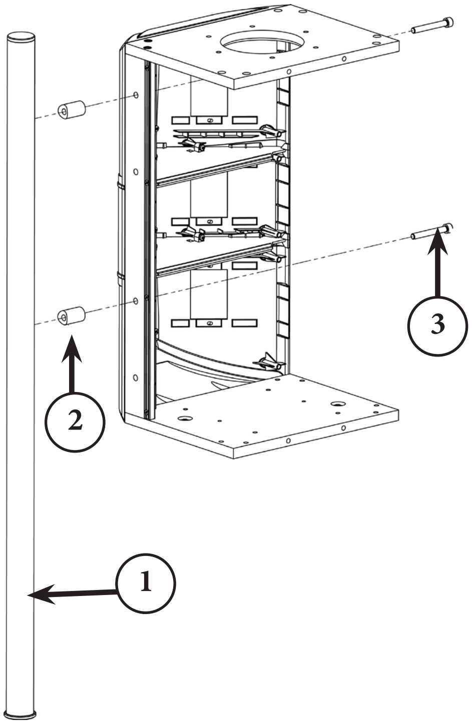
To remove the front and back plates:

1. Use a Phillips head screw driver to loosen the eight M4x12 screws (Item 2 in the figure above) holding the plate to the Flexis Service Head. Do not remove the screws completely, as they are captive and should remain attached to the face plate.
2. Note the tether (Item 5) attached to the face plate (Item 1) and top plate (Item 6). Do not remove the tether, to prevent damage to ground wire.

To attach the front and back plates:

1. Align the face plate so that it is flush and fitted into the open service head.
2. Attach the face plate by loosely threading the eight M4x12 screws.
3. Tighten all screws completely.

17.7.2 Removing and Attaching the MFR



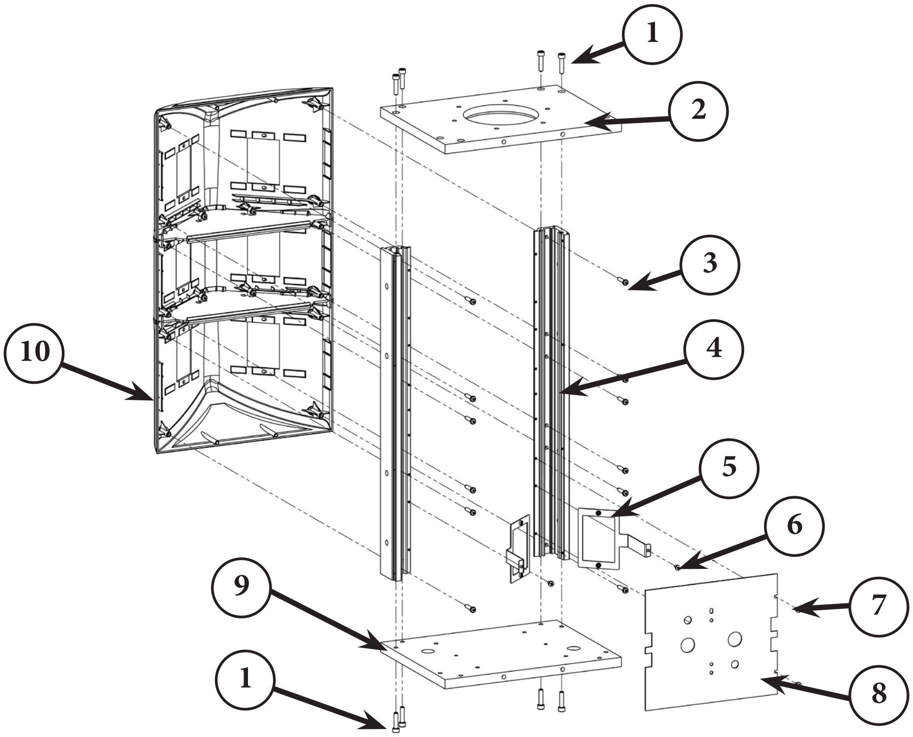
To remove the MFR:

1. Remove the two M8x3060 screws using an M6 Allen wrench (Item 3 in the figure above).
2. Catch the MFR support spacer (Item 2), to prevent it from falling once the screws have been removed from the assembly.
3. Do not remove the end stop on the lower end of the MFR.

To attach the MFR:

1. Position the MFR with the screw holes towards the top. The rail will hang lower than the service head. Replace MFR's in the same orientation as the original.
2. Thread one of the M8x30 M8x60 screws through the spacer and into the rail. Do not tighten.
3. Thread the second M8x30 M8x60 screw through the spacer and into the rail.
4. Tighten all screws.

17.7.3 Removing Extrusions



Caution **There is a potential for shock since a vertical separator needs to be removed prior to taking off an extrusion.**

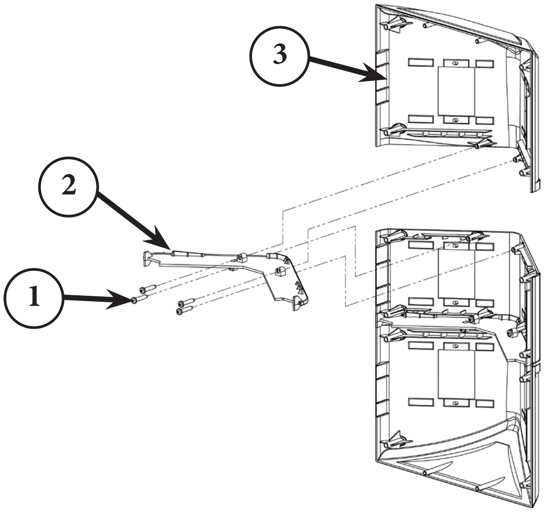
1. Use an M5 Allen wrench to remove the two M6x25 screws (Item 1 in the figure above) that attach the top plate (Item 2) to the extrusion.
2. Remove the two M6x25 screws that attach the bottom plate (Item 9) to the extrusion.
3. Use the M5 Allen wrench to loosen the four M6x25 screws attaching the top and bottom plates to the extrusion.
4. Use a Phillips screw driver to remove the two screws connecting the Vertical Separator (Item 8) to the extrusion. Each separator has two M4x8 screws on the same side.
5. Slide the separator out of the opposite extrusion.
6. Only remove the screws on the extrusion to be replaced. Use a Phillips screw driver to remove the screws (Item 6) connecting any UL brackets to the extrusion (Item 5). Each bracket has one M4x8 screw.
7. Remove the M5x25 screws using a Phillips screw driver that attach the side modules to the service head . There are two screws per module, per extrusion (Item 3).
8. Slightly slide the extrusion (Item 4) away from the side modules and then remove from service head.

17.7.4 Installing Extrusions

1. Insert the new extrusion in the same orientation as the original, with the threaded rail facing toward the face plate. Position the extrusion so that it is flush in the corner between the side modules and bottom/top plates.
2. Thread two M6x25 screws (Item 1) through the top plate (Item 2) into the extrusion and tighten.

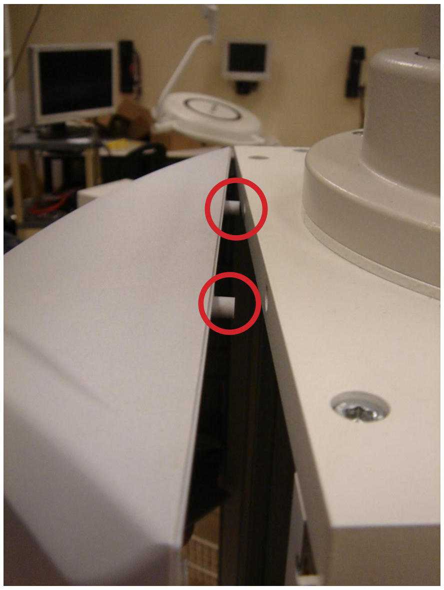
3. Thread two M6x25 screws through the bottom plate (Item 9) into the extrusion and tighten.
4. Retighten the M6x25 screws on the opposite extrusion.
5. With a Phillips screwdriver, tighten the M5x25 screws attaching the side modules to the service head. Note that there are two screws per module, per extrusion. (Item 3) Repeat for all remaining screws.
6. Re-attach all UL brackets (one screw each).
7. Insert Vertical Separators into groove of extrusion on the opposite side and replace the two screws in each.

17.7.5 Removing Modules



End Module

1. Using a Phillips screw driver, remove any vertical separators or UL brackets from the extrusions (see Section 17.5.3 - Removing Extrusions).
2. Remove the four M5x25 screws on both sides of the module attaching it to the extrusions.
3. Remove the two M4x16 and M4x25 screws attaching the horizontal separator to the side module (Item 1 in the figure above).
4. Remove any latch valves or electrical outlets from the module.
5. Tilt the open end away from the service head to release the set pins (Figure X, #4) and pull the module away, as shown in the following figure.



Side module

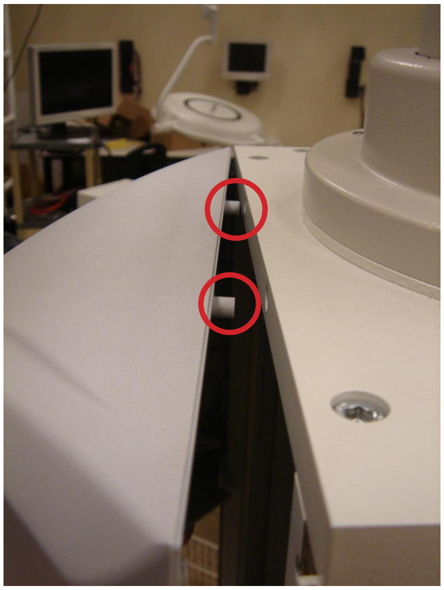
1. Loosen either one of the end modules.
2. Remove any vertical separators or UL brackets from the extrusions (see Section 17.5.3 - Removing Extrusions).
3. Remove the M5x25 screws and on either side of the module attaching it to the extrusions.
4. Remove four M4x16 and M5x25 screws attaching the horizontal separators to the side module (Item 1 in the figure above); there are two screws attached to each horizontal separator.
5. Remove any latch valves or electrical outlets from the module.
6. The side module will be tucked into each separator, so carefully extract the side module from the separator and then from the service head.

17.7.6 Installing Modules

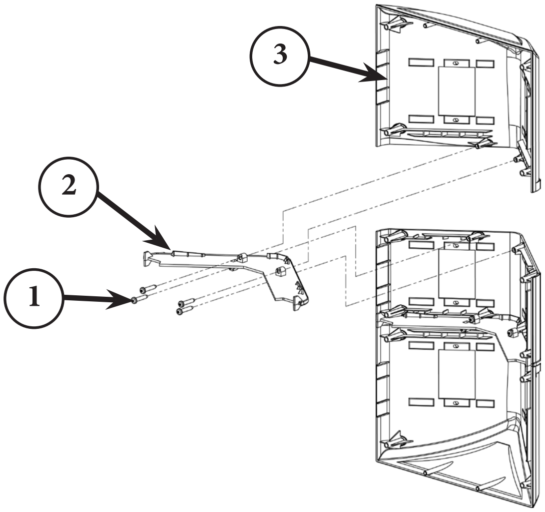
WARNING **Power should be cut from the boom system prior to removing any modules.**

End Module

1. Fit the end module into the horizontal separator groove and then insert the set pins into the top/bottom plate.
2. Reconnect and reattach any latch valve assemblies or power outlets.



3. Attach two M4x16 and M5x25 screws with a Phillips screw driver through the horizontal separator to the side module (Item 1 below)
4. Attach the two sets of four M5x25 screws on either side of the module, attaching it to the extrusions.
5. Reconnect and reattach any latch valve assemblies or power outlets, or other low voltage plates..
6. Reinstall any vertical separators or UL brackets into the extrusions (mentioned in Section 17.5.3, Removing Extrusions).



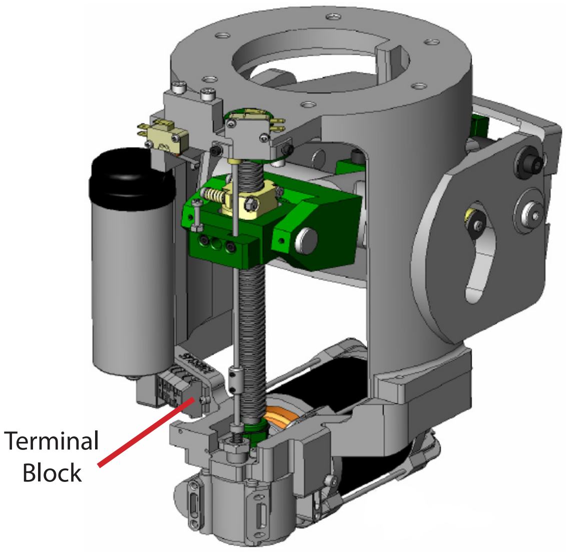
Side module

1. With either end module loosely fitted, insert the side module into both horizontal separators.
2. Reconnect and reattach any latch valve assemblies or power outlets.
3. Using a Philips screwdriver, attach the four M4x16 and 5x25 screws through the horizontal separators to the side module (Item 1 in the preceding figure); there are two screws attached to each horizontal separator.
4. Attach both sets of four M5x25 screws on either side of the module attaching it to the extrusions.
5. Reconnect and reattach any latch valve assemblies, power outlets, or other low voltage plates.
6. Reconnect and reattach any latch valve assemblies or power outlets.

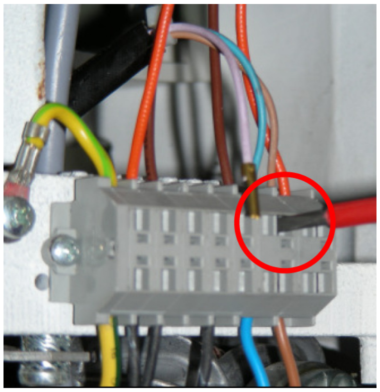
7. Reinstall any vertical separators or UL brackets into the extrusions (mentioned in in Section 17.5.3, Removing Extrusions).
8. Tighten all screws in the end modules.

17.8 Replacing the Motor

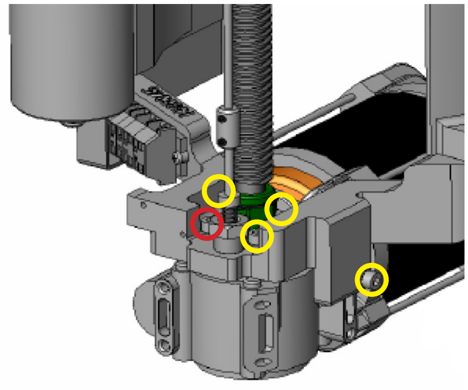
WARNING **Power should be cut from the EP module, Motor and other electrical modules of the service head prior to removing any modules.**



1. Dismantle the motor cover halves.



2. Remove the purple, blue, and brown wires.
3. Remove the cable clip at the capacitor. The motor connection cable with now hang loose.



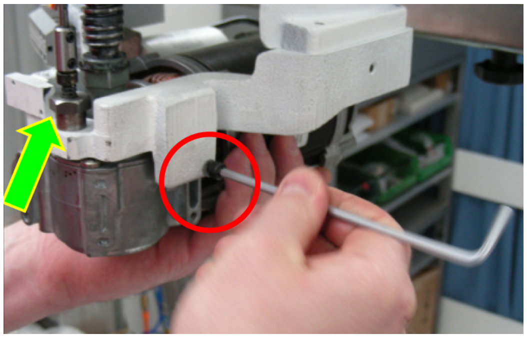
4. Loosen three of the four Allen screws from the top (shown in yellow) with a 4mm Allen wrench.

Caution **Do not lose the removed Allen screw.**

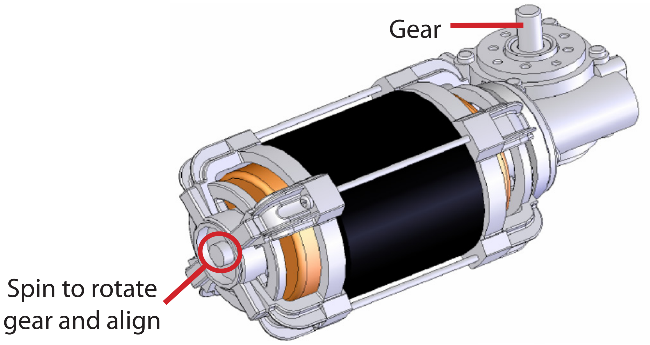
5. Loosen the side Allen screw.

6. Loosen the remaining Allen screw from the top (shown in red).

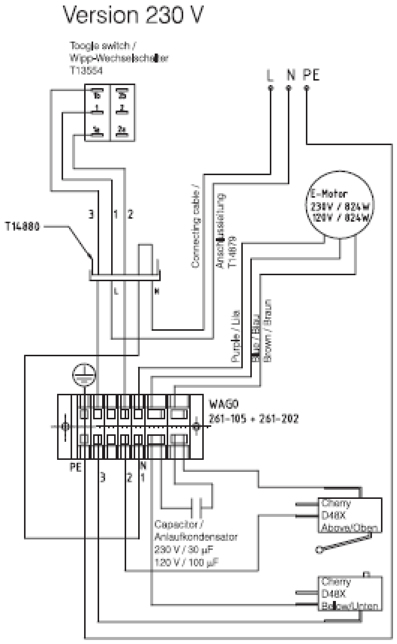
> **Caution** **Hold the motor while removing the Allen screws to prevent it from falling.**

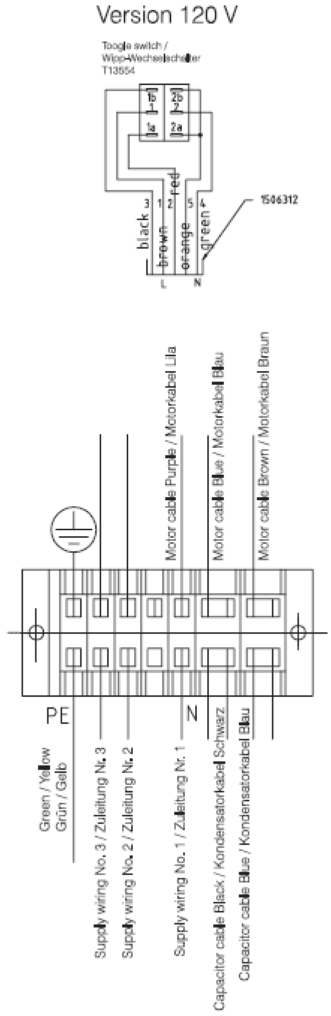


7. Install new motor. It is a keyed entry into the drive screw; also known as the worm gear. Spin the knob on the back of the motor to move the gear and line up key.
8. Attach the motor by re-installing the five Allen screws that were previously removed.


Gear
Spin to rotate gear and align

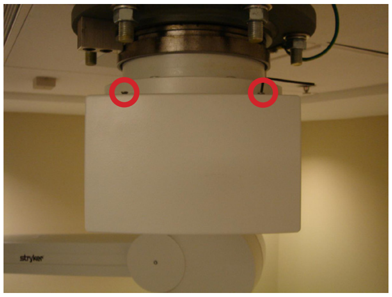
9. Plug cables back into terminal block in the same location as before.


Version 230 V
Toogle switch / Wipp-Wechselschalter T13554
1b
1
1a
2b
2
2a
L
N
PE
T14880
3
1
2
L
N
Connecting cable / Anschlussleitung T14879
E-Motor 230V / 824W 120V / 824W
Purple / Lila
Blue / Blau
Brown / Braun
WAGO 261-105 + 261-202
PE
3
2
N
1
Capacitor / Anlaufkondensator 230 V / 30 µF 120 V / 100 µF
Cherry D48X Above/Oben
Cherry D48X Below/Unten

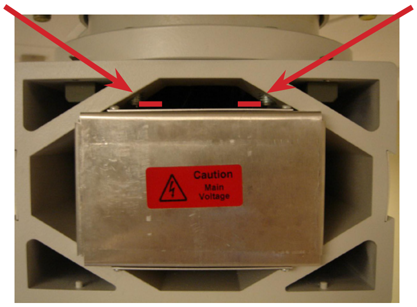

Version 120 V
Toogle switch / Wipp-Wechselschalter T13554
1b
1
1a
2b
2
2a
red
3
1
2
5
4
black
brown
orange
green
L
N
1506312
Molor cable Purple / Motorkabel Lila
Motor cable Blue / Motorkabel Blau
Motor cable Brown / Motorkabel Braun
PE
N
Green / Yellow Grün / Gelb
Supply wiring No. 3 / Zuleitung Nr. 3
Supply wiring No. 2 / Zuleitung Nr. 2
Supply wiring No. 1 / Zuleitung Nr. 1
Capacitor cable Black / Kondensatorkabel Schwarz
Capacitor cable Blue / Kondensatorkabel Blau

17.9 Electro-Pneumatic (EP) Module

17.9.1 Removing the Electro-Pneumatic (EP) Module

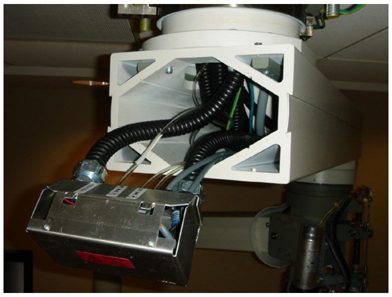


1. Remove the end cap by unscrewing the two (2) screws attaching the top portion of the end cap.



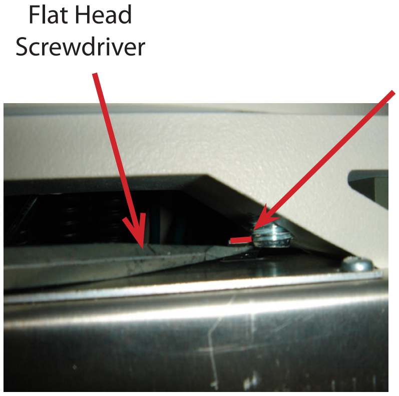
2. With a flat head screwdriver, gently press down on the two tabs keeping the EP Module in place.
3. Extract the EP Module by carefully pulling the module away from the boom arm.

Caution **Be very careful as high voltage may be present inside of the EP module. There are also low voltage cables as well as gas hoses attached to this module. If it is difficult to extract the EP Module, ensure there is sufficient slack in the control cables, brake hosing and electrical conduits.**



4. Rest the EP Module to the side so that you may work in the arm set.
5. Articulate the boom arm to ensure the EP module was correctly replaced.

17.9.2 Installing an Electro-Pneumatic (EP) Module

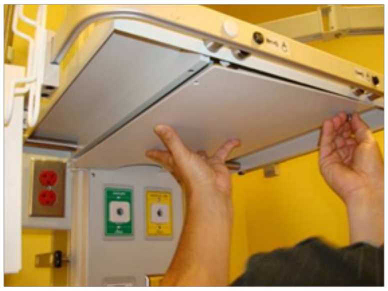


1. Insert the EP module into the arm set opening. Pay close attention to the slots allocated in the arm set to fit the EP Module box.
2. Ensure the tabs on the top of the EP module are securing it in place. In some cases, you may need to insert a flat head screwdriver to push the tabs up.
3. Reinstall the end cap where the open tabs are located on the bottom.

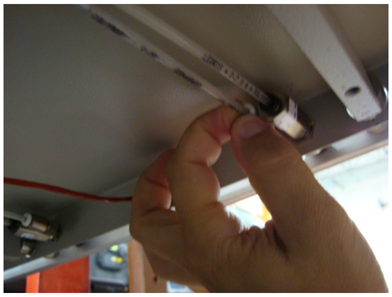
17.10 Generation 1 Service Head

17.10.1 Replacing a Shelf with Brake

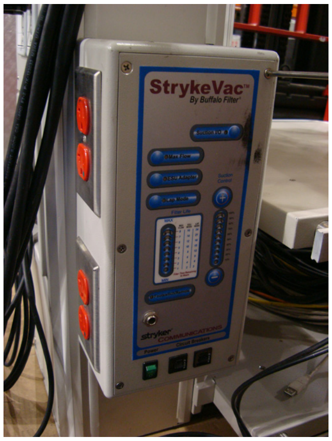
1. Remove air pressure at the source (regulator located on the Riser Bracket above ceiling) by turning regulator adjustment until needle is at 0.
2. If boom has StrykeVac, customer's electrician shall verify all electrical power to boom is off.



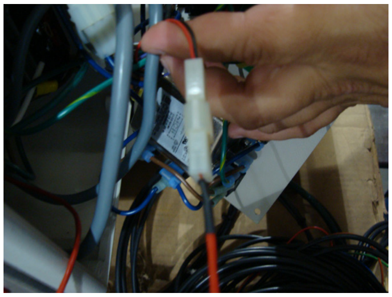
3. Remove the four screws and washers from plate on bottom of shelf.

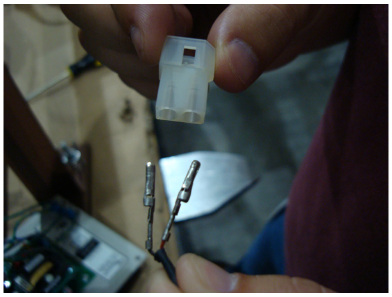


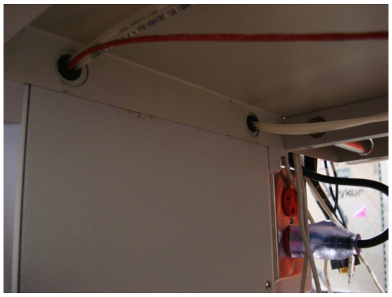
4. Label the brake lines to prevent improper reconnection.
5. Remove the two brake lines from each pneumatic brake button.



6. If boom does not have StrykeVac, skip to step 10.
7. Remove the six Phillips head screws and unplug the red wire. Then remove the wires from connector and pull through shelf.

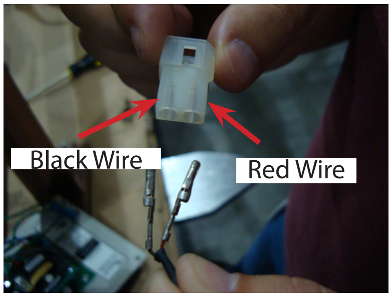




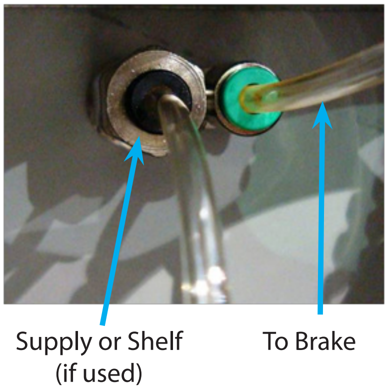


8. Remove protective caps and four screws that attached shelf to service head.

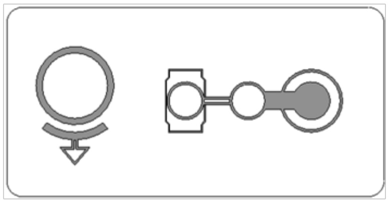
9. Remove shelf and pull air lines out of the back of the shelf.
10. If a StrykeVac is installed, pull red wire through new shelf and attach shelf.



11. Place wires in connector and connect Strykvac.
12. Reattach Strykvac panel.
13. Pull air line through new shelf.
14. Reattach shelf and replace plastic covers.

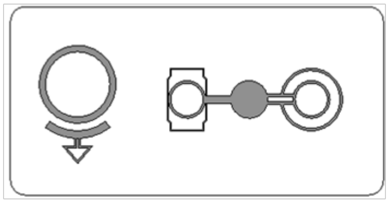


15. Insert the supply tubing into the Center Solenoid Connector.
16. Insert the Brake Bladder tubing in the outboard Solenoid Connector.
17. Turn on the air supply and power to boom.
18. Verify that no leaks are heard and all power to boom works.



Ceiling Brake

19. Verify the operation matches the label on the rail to the tubing coming from the green port on the matching solenoid of the shelf brake.



Mid Brake

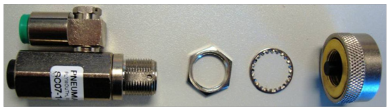
20. Reattach bottom the plate.

17.10.2 Replacing the Brake Button

1. Make sure the air supply to the brake line (regulator located on the Riser Bracket) is off.

2. Remove the four screws and washers from the plate on the bottom shelf.
3. Remove the brake tubing from the defective brake by pressing the plastic ring toward the body of brake button to release the tubing.

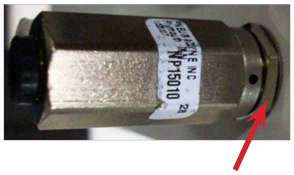
4. Loosen the four hex screws on the shelf rail.
5. Remove the Brake Button extension.
6. Unscrew the external ring and remove the defective Brake Button.



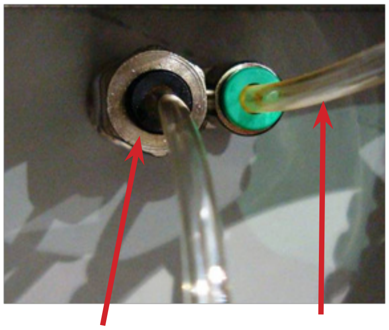
7. Assemble the Brake Solenoids to the shelf.

8. Thread the lock nut all of the way onto the Brake Solenoid.
9. Add the lock washer.
10. Insert the Solenoid into the shelf.

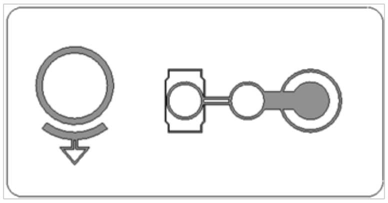
11. Screw the button onto the Solenoid.



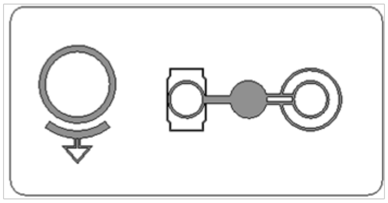
12. Adjust the lock nut from behind to tighten the assembly.
13. Repeat the procedure for the second button.



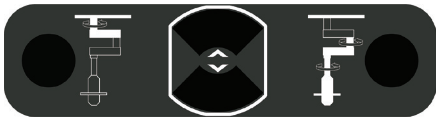
14. It there is only one button in the Service Head, insert the supply tubing into the Center Solenoid Connection.
15. Insert the Brake Bladder tubing in the outboard Solenoid Connector.
16. Turn on the air supply.
17. Verify that no leaks can be heard.



Ceiling Brake



Mid Brake



FLEXiS Brake Buttons

18. Verify the operation matches the label on the rail to the tubing coming from the green port on matching the Solenoid of the shelf brake.

18. Servicing the LED

Refer to Visum LED Surgical Lights Service Manual (1004400195) for servicing instructions.

19. Replacement Part Numbers

Part	Description
P17728	REPAIR, TOP PLATE, EDS 600, SH2
P17730	REPAIR, TOP PLATE, EDS 400, SH2
P17731	REPAIR, TOP PLATE, EDS 200, SH2
P17732	REPAIR, BOTTOM PLATE, SH2
P17733	REPAIR, CORNER MODULE, 1-GANG FRONT, 1-GANG BACK, SH2
P17734	REPAIR, CORNER MODULE, 2-G FRONT, 1-G BACK, SH2
P17735	REPAIR, CORNER MODULE, 3-G FRONT, 1-G BACK, SH2
P17736	REPAIR, CORNER MODULE, 1-G FRONT, 2-G BACK, SH2
P17737	REPAIR, CORNER MODULE, 1-G FRONT, 3-G BACK, SH2
P17738	REPAIR, HORIZONTAL SEPARATOR, SH2
P17739	REPAIR, HORIZONTAL SEPARATOR W/CUTOUT, SH2
P17740	REPAIR, EXTRUSION, 420MM SH, SH2
P17741	REPAIR, EXTRUSION, 550MM SH, SH2
P17742	REPAIR, EXTRUSION, 680MM SH, SH2
P17743	REPAIR, FRONT/BACK PLATE, 3X 1G V, 420MM SH2
P17744	REPAIR, FRONT/BACK PLATE, 1X1G V, 1X3G H, 420MM, SH2
P17745	REPAIR, FRONT/BACK PLATE, 1X4G H, 2X1G H, 420MM, SH2
P17746	REPAIR, FRONT/BACK PLATE, 1X4G H, 1X2G H, 420MM, SH2
P17747	REPAIR, FRONT/BACK PLATE, 2X3G H, 420MM, SH2
P17748	REPAIR, FRONT/BACK PLATE, 1X3G H, 1X2G H, 1X1G H, 420MM, SH2
P17749	REPAIR, FRONT/BACK PLATE, 4X1G H, 420MM, SH2
P17750	REPAIR, FRONT/BACK PLATE, BLANK, 420MM, SH2
P17751	REPAIR, FRONT/BACK PLATE, 4X 1GV, 550MM, SH2
P17752	REPAIR, FRONT/BACK PLATE, 2X 1GV, 1X3GH, 550MM, SH2
P17753	REPAIR, FRONT/BACK PLATE, 2X 4GH, 1X 1GH, 550MM, SH2
P17754	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X3GH, 1X2GH, 550MM, SH2
P17755	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X3GH, 1X1GH, 550MM , SH2
P17756	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X2GH, 2X1GH, 550MM, SH2
P17757	REPAIR, FRONT/BACK PLATE, 2X3GH, 2X1GH, 550MM SH, SH2
P17758	REPAIR, FRONT/BACK PLATE, 1X3GH, 2X2GH, 1X1GH, 550MM, SH2
P17759	REPAIR, FRONT/BACK PLATE, 1X4GH, 4X1GH, 550MM, SH2
P17760	REPAIR, FRONT/BACK PLATE, BLANK, 550MM, SH2
P17761	REPAIR, FRONT/BACK PLATE, 1X3GH, 3X1GV, 680MM SH, SH2
P17762	REPAIR, FRONT/BACK PLATE, 5X 1G V.STEGG, 680MM SH2
P17763	REPAIR, FRONT/BACK PLATE, 3X4GH, 680MM, SH2
P17764	REPAIR, FRONT/BACK PLATE, 2X4GH, 1X3GH, 680MM, SH2
P17765	REPAIR, FRONT/BACK PLATE, 2X4GH, 1X2GH, 1X1GH, 680MM, SH2
P17766	REPAIR, FRONT/ BACK PLATE, 2X4GH, 3X1GH, 680MM, SH2

Part	Description
P17767	REPAIR, FRONT/BACK PLATE, 1X4GH, 2X3GH, 1X1GH, 680MM, SH2
P17768	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X3GH, 2X2GH, 680MM, SH2
P17769	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X3GH, 3X1GH, 680MM, SH2
P17770	REPAIR, FRONT/BACK PLATE, 1X4GH, 1X2GH, 4X1GH, 680MM, SH2
P17771	REPAIR, FRONT/BACK PLATE, 1X4GH, 5X1GH, 680MM, SH2
P17772	REPAIR, FRONT/BACK PLATE, BLANK, 680MM, SH2
P17773	REPAIR, MFR SUPPORT SPACER, SH2
P17774	REPAIR, MFR TOP PLUG, SH2
P17775	REPAIR, CORNER MODULE, BLANK, SH2
P17776	REPAIR, CLAMP - SHELF, SH2
P17777	REPAIR, SHELF END CAP, SH2
P17778	REPAIR, FRONT/BACK PLATE, 1X3GH, 3XDKD, 1X1GH, 680MM, SH2
P17779	REPAIR, INTERNAL SHELF CABLE, SH2
P17780	REPAIR, HANDLE ASSEMBLY, 2 BRAKE, UP/DOWN, SH2
P17781	REPAIR, HANDLE ASSEMBLY, 2 BRAKE, SH2
P17782	REPAIR, CABLE, CONTROLLER TO SERVICE HEAD, SH2
P17784	REPAIR, DUPLEX FACEPLATE, 4-GANG
P17785	REPAIR, MFR ASSEMBLY, 1000/298, SH2
P17786	REPAIR, SPLIT DATA PASS THROUGH ASSEMBLY, 1-GANG
P17787	REPAIR, SPLIT DATA PASS THROUGH, 1-GANG
P17788	REPAIR, JUNCTION BOX, 1-GANG 2.5”
P17789	REPAIR, SHELF FAIRFIELD RAIL, AL, SH2
P17790	REPAIR, HANDLE BOTTOM PLATE BRACKET, SH2
P17791	REPAIR, MFR ASSEMBLY, 500/298, SH2
P17792	REPAIR, MFR ASSEMBLY, 600/298, SH2
P17793	REPAIR, BLANK PLATE, 4-GANG
P17794	REPAIR, BLANK PLATE, 1-GANG
P17795	REPAIR, BLANK PLATE, 2-GANG
P17797	REPAIR, BLANK PLATE, 3-GANG
P17798	REPAIR, MFR ASSEMBLY, 1000/500, SH2
P17799	REPAIR, MFR ASSEMBLY, 600/500, SH2
P17800	REPAIR, CABLE, SERVICE HEAD TO SHELF D-SUB, SH2
P17801	REPAIR, GROUNDING BRACKET, SINGLE, ASSEMBLY, SH2
P17802	REPAIR, CABLE, CONTROLLER TO SHELF, SH2
P17804	REPAIR, BLIND CAP, D9.3MM, GPN 300 V 031
P17805	REPAIR, GROMMET PG16, GLOSED PVC
P17806	REPAIR, FRONT/BACK PLATE TETHER 1X300MM
P17807	REPAIR, PNEUMATIC CONTROLLER BOX ASSEMBLY, OSC 400
P17808	REPAIR, PNEUMATIC CONTROLLER BOX ASSEMBLY, OSC 600
P17809	REPAIR, GROUND BAR GB10, STANDARD UL BAR

Part	Description
P17810	REPAIR, STRAIN RELIEF (CORD GRIP)
P17811	REPAIR, JUNCTION BOX, 3-GANG, MASONRY STYLE, 3.5”
P17812	REPAIR, BRACKET, HANDLE TO MFR MOUNTING, SH2
P17813	REPAIR, JUNCTION BOX, 4-GANG, MASONRY STYLE, 3.5”
P17814	REPAIR, LEVITON 8300-R NEMA 5-20R
P17815	REPAIR, FACEPLATE RATING LABEL, 20A 125V
P17816	REPAIR, LEVITON 8300-W NEMA 5-20R
P17817	REPAIR, DUPLEX FACEPLATE, 2-GANG
P17818	REPAIR, DUPLEX FACEPLATE, 3-GANG
P17819	REPAIR, LEVITON 5371 NEMA 5-30R
P17820	REPAIR, FACEPLATE, 1-GANG DUPLEX, LEVITON 84003-40
P17821	REPAIR, LEVITON 8400-W NEMA 6-20R
P17822	REPAIR, LEVITON 5372 NEMA 6-30R
P17823	REPAIR, LEVITON 8400-R NEMA 6-20R
P17824	REPAIR, LEVITON 4700 NEMA 5-15R
P17825	REPAIR, FACEPLATE, 1-GANG, LEVITON 84020-40
P17826	REPAIR, LEVITON 2310 NEMA L5-20R
P17827	REPAIR, LEVITON 4550 NEMA L6-15R
P17828	REPAIR, LEVITON 2610 NEMA L5-30R
P17829	REPAIR, LEVITON 2320 NEMA L6-20R
P17830	REPAIR, LEVITON 2620 NEMA L6-30R
P17831	REPAIR, LEVITON 8200-R NEMA 5-15R
P17832	REPAIR, LEVITON 8200-W NEMA 5-15R
P17833	REPAIR, LEVITON 8600 NEMA 6-15R
P17834	REPAIR, LINE, 12 AWG, 5200MM, BLACK
P17835	REPAIR, NEUTRAL,12 AWG, 5200MM, WHITE
P17836	REPAIR, GROUND,12 AWG, 5200MM
P17837	REPAIR, GROUND, 12 AWG, 5200MM, W/CABLE EYE
P17838	REPAIR, LINE, ISOLATED, 12 AWG, 5200MM, BROWN
P17839	REPAIR, NEUTRAL, ISOLATED, 12 AWG, 5200MM, ORANGE
P17840	REPAIR, LINE, 10 AWG, 5200MM, BLACK
P17841	REPAIR, NEUTRAL,10 AWG, 5200MM, WHITE
P17842	REPAIR, GROUND, 10 AWG, 5200MM
P17843	REPAIR, GROUND,10 AWG, 5200MM, W/CABLE EYE
P17844	REPAIR, LINE, ISOLATED,10 AWG, 5200MM, BROWN
P17845	REPAIR, NEUTRAL, ISOLATED, 10 AWG, 5200MM, ORANGE
P17846	REPAIR, PNEUMATIC CONTROLLER BOX ASSEMBLY, MMP 200
P17847	REPAIR, KOPEX CONDUIT, KEBF04, 4.6M
P17848	REPAIR, 1/2” LIQUIDTIGHT METAL CONDUIT FTG, STRA
P17849	REPAIR, CORNER MODULE, 3G FRONT, SH2

Part	Description
P17850	REPAIR, CORNER MODULE, 3G BACK, SH2
P17851	REPAIR, MIDDLE MODULE, 3G BACK, SH2
0682-315-000	TRIM PLATE, LATCH VALVE, PLASTIC
0682-305-010	6-32 X 1/2 PHILLIPS OVAL SS M/S 18.88
0682-305-012	MACHINE SCREW, FLAT HEAD, 6-32 X 1/2"
0682-305-013	NUT, HEX W/ TOOTH WASHER, #6-32
0682-315-001	LATCH VALVE ASSEMBLY, NITROGEN, DISS
0682-315-002	LATCH VALVE ASSEMBLY, CARBON DIOXIDE, DISS
0682-315-003	LATCH VALVE ASSEMBLY, OXYGEN, DISS
0682-315-004	LATCH VALVE ASSEMBLY, NITROUS OXIDE, DISS
0682-315-005	LATCH VALVE ASSEMBLY, MEDICAL AIR, DISS
0682-315-006	LATCH VALVE ASSEMBLY, VACUUM, DISS
0682-315-007	LATCH VALVE ASSEMBLY, WAGD, DISS
0682-315-008	LATCH VALVE ASSEMBLY, ISO, OXYGEN, PB
0682-315-009	LATCH VALVE ASSEMBLY, NITROUS OXIDE, PB
0682-315-010	LATCH VALVE ASSEMBLY, MEDICAL AIR, PB
0682-315-011	LATCH VALVE ASSEMBLY, VACUUM, PB
0682-315-012	LATCH VALVE ASSEMBLY, WAGD, PB
0682-315-013	LATCH VALVE ASSEMBLY, OXYGEN, CHEMETRON
0682-315-014	LATCH VALVE ASSY, NITROUS OXIDE, CHEMETRON
0682-315-015	LATCH VALVE ASSY, MEDICAL AIR, CHEMETRON
0682-315-016	LATCH VALVE ASSY, VACUUM, CHEMETRON
0682-315-017	LATCH VALVE ASSEMBLY, WAGD, CHEMETRON
0682-315-018	LATCH VALVE ASSEMBLY, OXYGEN, OHMEDA
0682-315-019	LATCH VALVE ASSEMBLY, NITROUS OXIDE, OHMEDA
0682-315-020	LATCH VALVE ASSEMBLY, MEDICAL AIR, OHMEDA
0682-315-021	LATCH VALVE ASSEMBLY, VACUUM, OHMEDA
0682-315-022	LATCH VALVE ASSEMBLY, WAGD, OHMEDA
0682-315-023	LATCH VALVE ASSEMBLY, OXYGEN, OXYEQUIP
0682-315-024	VALVE ASSEMBLY, NITROUS OXIDE, OXEQUIP
0682-315-025	LATCH VALVE ASSEMBLY, MEDICAL AIR, OXEQUIP
0682-315-026	LATCH VALVE ASSEMBLY, VACUUM, OXEQUIP
0682-315-029	BACKBODY, NITROGEN, DISS INLET
0682-315-030	BACKBODY, OXYGEN DISS INLET
0682-315-031	BACKBODY, NITROUS OXIDE, DISS INLET
0682-315-032	BACKBODY, MEDICAL AIR, DISS INLET
0682-315-033	BACKBODY, VACUUM, DISS INLET
0682-315-034	BACKBODY, WAGD, DISS INLET
P12930	SCREW, M6X25, SOCKET CAP
P12931	LOCK WASHER, 6MM

Part	Description
P12943	PT SCREW ROUND HEAD WN-1412, M5X25
P12972	SCREW, M10X25, CLASS 8.8
P12973	SCREW, M8X25, CLASS 8.8
P13034	SCREW, ISO 10642 M8X30
P13037	MFR SAFETY STOP WASHER, SH2
P13039	LOCK WASHER, 8MM
P13042	SCREW, M4X8, DIN 7985
P13043	CAPTIVE SCREW, M4X12
P13435	NITROGEN REGULATOR, DISS, SH2
P13436	INSTRUMENT AIR REGULATOR, DISS, SH2
P13518	SCREW, ISO 4762 M8X60
P13532	SCREW, M12X35, ISO 4762
P13533	SCREW, FLAT HEAD, SST M8X50
P13539	SCREW, M5X35, DIN 912
P13631	PT SCREW ROUND HEAD WN-1412, M4X16
P13803	FLAT HEADED SCREW DIN 920 M3X8
P13804	CYLINDER HEAD SCREW ISO 4762 M5X12
P13805	OVAL HEAD SCREW PT 2.5X6 WN 1412
P13806	SCREW, DIN7991-A2, M5X16
P13847	SCREW, M8X35, DIN 912
P13848	SCHNORR SAFETY WASHER VS 8 - ART.NR.4510
P13850	NUT M8 DIN 934
P13851	SCREW M8X40 DIN 6912
P13911	WASHER,M4, DIN 125
P13912	M4 SERRATED LOCK WASHER DIN 6798
P13913	NUT, M4, DIN934
P13915	WASHER, M4, DIN 9021
P13925	SCREW, COUNTER SUNK, SST, M5X10
P13927	SCREW, M8X35, DIN 6912
P13929	SCREW, M4X25, DIN 7985
P13930	SCREW, M4X20, DIN 7985
P13931	SCREW, M3X10, DIN 966
P13932	SCREW, 6-32 X 1/2 PHILLIPS PAN HEAD
P13933	SCREW 6-32 X 1/2" PHILLIPS FLATHEAD
P14300	BACKBODY, INSTRUMENT AIR, DISS INLET
P14301	LATCH VALVE ASSEMBLY, AMICO, INSTRUMENT AIR, DISS
P14303	LATCH VALVE ASSEMBLY, AMICO, N2O, OXEQUIP
P14305	LATCH VALVE ASSEMBLY, AMICO, MED AIR, OXEQUIP
P14307	LATCH VALVE ASSEMBLY, AMICO, WAGD, OXEQUIP
P14706	CYLINDER HEAD SCREW DIN 912 M12X18

Part	Description
P14707	CYLINDER HEAD SCREW DIN 912 M5X20
P14879	SCREW, 6-32 X 1/2 PHILLIPS PANHEAD M/S ZINC
P14935	NUT, HEX W/ TOOTH WASHER, #6-32, ZINC PLATED
P15431	HOSE ASSEMBLY, INSTRUMENT AIR 22 DISS
P16270	CLIP NUT, SH2
P17884	PANEL GROUND WIRE & HARDWARE

20. Contact Information

Contact Stryker Customer Service with questions or concerns.

Stryker Communications
1410 Lakeside Parkway #100
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Toll Free: (877) 789-7100
1-972-410-7100

For international service locations, refer to the Stryker website at the following URL: **www.stryker.com**.

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